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A True and Particular HISTORY OF EARTHQUAKES.

CONTAINING

A Relation of that dreadful EARTHQUAKE which happen'd at *Lima* and *Callao*, in *Peru* *October* 28, 1746; publiſh'd at *Lima* by Command of the Vice-Roy, and now tranſlated from the Original *Spaniſh*; alſo of that which happen'd in *Jamaica* in 1692, and of others in different Parts of the World.

Accurately deſcribing

The dreadful Devaſtations that have been made by thoſe horrible Convulſions of the Earth; whereby Mountains have been thrown down, or remov'd to great Diſtances; Cities, with all their Inhabitants, ſwallow'd up in a Moment; whole Flocks and Herds, with their Keepers, ingulph'd in the tremendous Chaſms and Openings of Valleys; and large Foreſts ſunk, and for ever buried in an Inſtant.

Extracted from

Authors of the moſt unexceptionable Credit and Reputation.

By *PHILOTHEUS*.

LONDON:

Printed for the AUTHOR, and Sold by the Booksell Town and Country. 1748.

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PREFACE.

WHEN the Almighty, to puniſh the Wickedneſs of Men, is pleaſed to ſend forth his Judgments in the Earth, he gives Commiſſion to ſome one or other of his Creatures to execute his Purpoſe. At his Command, the Wind ſhall agitate the Sea ſo violently as to bury whole Navies in its Deep; or on Land ſhall work up a Storm that ſhall deſtroy the Fruits, throw down the talleſt Trees, or level the nobleſt Buildings with the Ground. If he pleaſes, the Air, which conveys Life and Breath to Man, ſhall be the Vehicle of Diſeaſes, Peſtilence and Death. By his Permiſſion, the Clouds ſhall pour down ſuch an Abundance of Water, that a whole Country, with all its Inhabitants, whether of the Brute or Human Kind, together with the Increaſe of the Earth, ſhall be ſwept away with a Flood. If he wills that Fire ſhall be the Miniſter of his Wrath, what dreadful Conflagrations are kindled up in an Inſtant, and what terrible Ruin follows every Step it proceeds! Even the moſt ſimple Creatures, to our Apprehenſion, have been

made the Inſtruments of his Vengeance, to puniſh a People that have obſtinately perſiſted in their Rebellion againſt Him. Flies, Lice, Frogs, Locuſts, &c. *have taught a proud Tyrant Humility; and* Pharaoh *is recorded as an Example to all ſucceeding Ages, of the Facility with which Omnipotence can puniſh proud Offenders, and of the Baſeneſs and Corruption of the Heart of Man, who would impute to any Cauſe, rather than his own incorrigible Diſobedience, thoſe peculiar Judgments which are manifeſtly the Finger of God, to correct him for, or reclaim him from, his Wickedneſs.*

But of all the Judgments with which the Supreme Governor of the World has thought fit to afflict the Sons of Men, ſurely none are ſo aſtoniſhing, ſo amazingly terrible as EARTHQUAKES; *which give little or no Warning of their Approach, nor ſcarce a Moment's Time for the wretched Inhabitants to lift up their Eyes to Heaven, and recommend themſelves to God, but are, in an Inſtant, either ſwallow'd up alive in the Openings of the Earth, or buried under the Ruins of their own Houſes. But I ſhall refer the Reader, for a farther Deſcription of ſuch dreadful Scenes, to the enſuing Sheets, where his Curioſity will be amply gratified, and his very Soul affrighted with the moſt horrible Deſolations that it is poſſible for the Imagination to conceive, and beyond the Power of Eloquence to deſcribe.*

But

But why (have ſome objected) ſhould we imagine, that Earthquakes *are the immediate Judgments of God, ſent by Him on Purpoſe for the Deſtruction of a City, or Diſtrict, or particular Part of a Country, ſince it's univerſally known they are produced by natural Cauſes? To this I anſwer, that the Almigh.., in the Government of the World, and in the Operations of his Providence, does, indeed, work by ſecondary Cauſes. Thus Rain, Hail, Snow, Froſt, Light and Heat, are produced according to thoſe Laws which He firſt impos'd on Matter; neither can any of them exceed the Limits which He has preſcrib'd to their ſeveral Spheres of Action, without his Permiſſion; and as every Creature was made for the Service or Pleaſure of Man, we may be aſſured, none of them ſhall hurt him, without a ſpecial Commiſſion from the Sovereign Diſpoſer of our Lives and Deſtinies: So that whenever we ſee any of the Creatures up in Arms againſt us, we ought to conclude, that they are the Meſſengers of Divine Juſtice, ſent to vindicate the diſregarded Honour of God, and to aſſert his Dominion in the Earth; to puniſh enormous Offenders for the notorious Breaches of his Laws, and to convince Mankind of their Weakneſs and Imbecility to cope with the meaneſt of his Creatures, whenever He empowers them to call their lordly Maſters to an Account.*

It is, indeed, allow'd, that Earthquakes *are produced by natural Cauſes; but* what thoſe *Cauſes are, which produce ſuch* tremendous Effects,

fects, have been the Subject of much Debate among the Learned. I ſhall, for the Satisfaction of the inquiſitive Reader, recite ſome of their Opinions, which ſeem to carry the moſt Probability with them.

M. Frezier, *late Engineer to* Lewis *XIVth of* France, *by whoſe Orders he viſited and examined the Kingdoms of* Peru *and* Chili, *accounts for theſe ſurprizing* Phænomena, *which are frequent in thoſe Countries, upon this Hypotheſis,* viz. *That the two main Principles of theſe dreadful Miſchiefs, are Heat and Moiſture.*

There is no reflecting upon ſuch extraordinary Phænomena, *ſays he, without being led by natural Curioſity to enquire into the Cauſe of them. That which Philoſophers generally aſſign for* Earthquakes, *does not always appear ſatisfactory. They are aſcribed to ſubterraneous Winds and Fires; but it is likely they ought rather to be look'd upon as an Effect of the Waters, which, upon digging, the Earth appears, every where, to be inwardly moiſten'd with, as living Bodies are by the Veins.*

Now, the Waters may occaſion Earthquakes *after ſeveral Manners; either by diſſolving the Salts ſcatter'd thro' the Earth, or by penetrating thro' porous Lands, mix'd with Stones, which they inſenſibly looſen; and the Fall or Removal thereof, muſt cauſe a Stroke or Shock, ſuch as is felt in* Earthquakes. *Laſtly, the Water penetrating ſome ſulphurous Bodies, muſt there cauſe a Fermentation; and then the Heat produces*

Winds

Winds and foul Exhalations, which infect the Air when they open the Earth; whence it is, that after great Earthquakes, *Abundance of People die.*

The Facility of this Fermentation is proved by the Example of Lima, *and by a curious Experiment of M.* Lemery, *particularized in the Memoirs of the Academy of Sciences, for the Year* 1700. *If, after having temper'd equal Parts of Filings of Iron, and of Sulphur, to a certain Quantity, as of thirty or forty Pounds, with Water; that Amalgama, or Paſte, be buried in the Ground a Foot deep, it will open and caſt forth hot Vapours, and then Flames.*

Now in Peru *and* Chili, *the Earth is all full of Mines of Salt, of Sulphur, and of Metals; add to this, that there are burning Monntains, which calcine the Stones, and dilate the Sulphur:* Earthquakes *muſt therefore be very frequent in thoſe Parts, and particularly, along the Sea-Coaſts, which are more water'd than towards the Top of the Ridge of Mountains, call'd* La Cordillera. *This is, beſides, quite agreeable to Experience; for there are ſome Places where thoſe Concuſſions of Nature are very rare, as at* Kuſko, Guamanga, *and elſewhere, for the ſame Reaſon that they are more frequent in* Italy, *towards the* Alps. *In fine, it cannot but be acknowledg'd, that the Water has great Share in* Earthquakes, *when we ſee Fields run like melted Wax; and Lakes form'd, on a ſudden, in Places which ſink; becauſe the* Ground *ſubſiding*

forces

forces the Water to riſe above it; or elſe to glide like Sand, when the Baſe is diſſolved, or on an inclining Plane.

Although Frezier *has aſſerted the Cauſe of* Earthquakes *to be Water, he is oblig'd to aſcribe it to Fire at laſt. For, in his laſt Inſtance, they are not the immediate Effect of Water, as in the two former Caſes, but of Heat ariſing from the Fermentation produced by Water. His Receipt from* Lemery *is a farther Proof of this; and all his Reaſoning afterwards is but a farther Proof of this.*

If Frezier *had but reflected, how ſmall a Quantity of Water was neceſſary to make the Amalgama, he would ſcarce have aſcribed the Cauſe of* Earthquakes *to Water: For being of the Conſiſtence of Paſte, and not reduced to a Fluid, the Quantity of Water muſt be very trivial in reſpect to the other Ingredients, agreeable to a Receipt of the ſame Nature communicated to Dr.* Wallis, *and inſerted hereafter; whereby it appears, that too much Water is the only Means or Inſtrument of kindling the Materials; and conſequently muſt be ſo far from the Cauſe of* Earthquakes, *that too much of that Element will hinder the Exploſion by which ſuch Effects are produced.*

I am likewiſe of Opinion, (ſays the Author of the Relation of the Earthquakes *at* Lima *and* Callao, *whoſe Obſervations I here uſe) that Volcanos, or fiery Irruptions, muſt help to prevent* Earthquakes; *as they ſerve to diſcharge*

the

the combuſtible Matters, and ventilate the ſulphurous Vapours, which occaſion them: So that were there a few Openings of that Kind in certain Parts of Peru *and* Chili, *(upon a Suppoſition that there is a Communication among the ſubterraneous Cavities) in all Likelihood theſe Countries would not be ſo frequently, if at all, plagued with ſuch dreadful Calamities.*

As to Fields being ſeen to run like Wax, and Lakes formed on a ſudden in Places which ſink: It does not neceſſarily follow from thence, that the Waters have a great Share in Earthquakes, *ſince thoſe Effects might have been produced by Waters lodged in the Earth, at a Diſtance from the Place where the Exploſion was made, to which the Openings of the Ground gave a Paſſage.*

However that be, the Hypotheſis which aſcribes the Cauſe of Earthquakes *to Wind and Fire, ſeems much more probable than that which imputes it to the Waters diſſolving the ſubterraneous Salts, or looſening the Stones; in which Caſes we ſhould not hear of thoſe dreadful Noiſes and ſulphurous Vapours which always precede* Earthquakes; *and ſhew that they are the Effects of ſome natural Exploſion, not of a bare falling or ſubſiding of the Earth. Beſides, the Earth does not always ſubſide, but is often lifted up perpendicularly, or horizontally agitated in ſuch a Manner as indicates an Impulſe from beneath. Let us therefore hear the* Sentiments of

ſome of our Engliſh *Philoſophers, on this important Subject.*

Dr. Liſter *aſcribes* Earthquakes *to the Pyrites, or Iron-Stone, lodged in the Cavities of the Earth, whoſe ſulphurous Vapours taking Fire, catch one another, as in a Train, and produce thoſe terrible Noiſes and Convulſions with which* Earthquakes *are attended.*

That the Earth is more or leſs hollow, is made probable by the natural Cavities or Chambers which are found every where in the Mountains by digging, and which the Miners of the North call Self-opens. *Theſe they meet with frequently, ſome vaſtly great, running away with ſmall Sinus's. Many are known to be open to the Day, as* Pool's-Hole, Okey-Hole, *&c. Beſide, the great and ſmall Streams which ariſe from under the Mountains, do evince the Hollowneſs of them. Add to theſe, that many Cavities are made, and continued by the Exploſion and Rending of the firſt Matter fired; which may, and do, very probably, cloſe again when the Force of that Exploſion is over, but are ſufficiently open to propagate the* Earthquake.

The Damps in our Mines ſufficiently witneſs, that theſe ſubterraneous Cavities are, at certain Times and Seaſons, full of inflammable Vapours, which being fired, do every Thing as in Earthquakes, *ſave in a leſſer Degree. Now, that the Pyrites alone, of all the known Minerals, yields this inflammable Vapour, the Doctor thinks to*

be

be highly probable, for theſe Reaſons. Firſt, *Becauſe no Mineral or Ore whatever is ſulphureous, but as it is wholly, or in part, a Pyrites. The Author had carefully made the Experiment on very many Foſſils of* England, *and found them all to contain Iron, wherever there was Brimſtone.*

Secondly, *Becauſe there is but one Species of Brimſtone, which he knows of, at leaſt, in* England; *and that ſince the Pyrites naturally and only yields Sulphur, it is to be preſum'd, that Brimſtone, wherever found, tho' in the Earth, or under Ground in Vapour, alſo proceeds from it. As for the* Sulphur-vive, *or natural Brimſtone, which is found in great Quantities in and about burning Mountains, it is certainly, according to the Doctor, the Effects of Sublimation, cauſed, in Length of Time, by the Violence of thoſe Fires.*

Altho' the Pyrites yields ſuch Store of Brimſtone, and naturally reſolves itſelf into Brimſtone by a kind of Vegetation, yet does it not follow, that its Subſtance, when once fired, muſt be quickly conſumed, and its Stores exhauſted. Now, to prove the durable burning of Pyrites, the Doctor produces Inſtances from divers Sorts of Coal. Scotch *Coal, ſaith he, has leſs of the Pyrites in it, being moſtly made of* Coal-Bitumen, *and therefore it burns ſwiftly, leaving a white Cinder. The* Sea-Coal, *or that which comes from* Newcaſtle *by Sea, conſumes ſlowly;*

and Sunderland *Sea-Coal ſo leiſurely, that it is ſaid, proverbially, to make three Fires. This hath much Pyrites mixt with it, and burns to a heavy reddiſh Cinder, which is Iron by the Magnet, for it attracts the Cinder in the ſame Manner it does Iron. But the Doctor had a Sample of Coal from* Ireland, *which was ſaid to be ſo laſting, that it would continue twenty-four Hours red-hot, without loſing ſcarce any Thing of its Figure. This, by its Weight and Colour, ſeem'd to be, in a great Meaſure, Pyrites.*

In England *the Pyrites is neither ſo plentiful, nor contains ſo much Sulphur as that in other Countries, for though there is ſome little in all Places, yet they are moſtly ſcatter'd; and if, by Chance, in Beds, theſe are comparatively thin, to what they are in burning Mountains: This may be one Reaſon why* England *is ſo little troubled with* Earthquakes, *and all the Parts almoſt round the* Mediterranean Sea, *particularly* Italy, *ſo much. There alſo the* Earthquakes *are frequent, long, and terrible, with many Paroxiſms in one Day, and that for many Days: Here very ſhort, but for a few Minutes, and ſcarce perceptible. Add to this, that the ſubterraneous Cavities in* England *are few and ſmall, compar'd to the vaſt Vaults in thoſe Parts of the World; which is evident from the ſudden Diſappearance of whole Mountains and Iſlands.*

It may be objected, that no Body is kindled by itſelf: *But it ſeemed to Dr.* Liſter *apparently*

rently otherwiſe; for that Vegetables will heat and take Fire of themſelves, is ſeen in the frequent Inſtance of Hay. Animals are naturally on Fire; and Man demonſtrates this when in a Fever. Among Minerals, the Pyrites, both in Groſs and in Vapour, is actually, of its own Accord, fired; of which Dr. Power, *in his* Micrographia, *produces a famous Inſtance, and the like not very rarely happens. In ſhort, that Damps naturally fire of themſelves, we have the general Teſtimony of Miners, as well as Declaration of the ſame Author.*

Nay, the Volcanos, all the World over, argue as much; for there is ſtrong Probability to believe, that they are Mountains made up, in great Part, of Pyrites, by the Quantities of Sulphur thence ſublimed, and the Application of the Loadſtone to the ejected Cinder. Now, that theſe Volcanos were naturally kindled *of themſelves, at or near the Creation, the Doctor holds probable, becauſe there is but a certain Number of them, which have all continued burning beyond the Memories of any Hiſtory. If therefore theſe Volcanos did not kindle of themſelves, he aſks, What Cauſe can be imagin'd to have done it? If the Sun, he anſwers,* Hecla, *placed in ſo extreme cold a Climate (as* Iceland) *was kindled, for ought he can ſee from Hiſtory, as ſoon as* Ætna *or* Fuogo, *which is a Mountain in the Iſland* Fuogo, *or St.* John's, *one of the* Cape Verd *Iſlands: Not the Accidents* happen-

ing from Men; becauſe they ſeem to have been fired before the World could be all over peopled; and being moſtly on the Tops of very high Mountains, were unfit for Habitation. If ſaid to be effected by Lightning and Thunder, or Earthquakes, *that is begging the Queſtion; for the Cauſe of the one is the Cauſe of the other.*

Thus far Dr. Liſter; *let us next ſee what Dr.* Wallis *ſays upon the ſame Occaſion. Thunder and Lightning, ſays he, are ſo very like the Effects of Gunpowder, that we may reaſonably judge them to proceed from like Cauſes. Now the principal Ingredients in Gun-powder are Nitre and Sulphur; the Admiſſion of Charcoal being chiefly to keep the Parts ſeparate, for the better kindling of it. So that if we ſuppoſe in the Air, a convenient Mixture of nitrous and ſulphurous Vapours, and thoſe, by Accident, to take Fire, the ſame kind of Exploſion may well follow, with ſuch Noiſe and Light, as in the firing of Gun-powder. And being once kindled, will run from Place to Place, as the Vapour leads it, juſt as in a Train of Gun-powder, and with like Effects.*

The Doctor has commonly obſerv'd, that the Noiſe is perceiv'd ſeven or eight Seconds (or half a Quarter of a Minute) later than the Flaſh; but ſometimes much ſooner, as in a Second, or two, nay, quicker, and almoſt immediately upon the Lightning: At theſe Junctures the Lightning muſt be very near, or even amongſt us;

and

and in ſuch Caſes, Dr. Wallis *had, more than once, foretold Miſchief, which happen'd accordingly.*

Now, that there is in Lightning a ſulphurous Vapour, is manifeſt from the ſulphurous Smell which attends, and a ſultry Heat in the Air, which is commonly a Forerunner of more Lightning. That there is likewiſe a nitrous Vapour with the ſulphurous, may be reaſonably judged, becauſe we do not know of any Body *ſo liable to a ſudden and violent Exploſion.*

As to the kindling of theſe Materials, in order to ſuch Exploſion, the Doctor was told, that a Mixture of Sulphur and Filings of Steel, with the Admiſſion of a little Water, would not only cauſe a great Effervеſcence, but of itſelf break forth into actual Fire. He ſays, a little Water, becauſe too much will hinder the Operation, or quench the Fire; which he takes to be the Caſe of Bath *Waters, and other hot Springs, where Steel and Sulphur cauſe a great Effervеſcence, but no Flame. So that there needs only ſome Chalybeat, or vitriolic Vapour (or ſomewhat equivalent) to produce the whole Effect, there being no Want of aqueous Matter in the Clouds, and there is no Doubt but, amongſt the various Effluvia from the Earth, there may be copious Supplies of Ingredients for ſuch Mixtions.*

After the ſame Manner we may account for the kindling of Ætna, *and other burning Mountains, where the Mixture of* Steel and Sulphur

may

may produce a Flame, which is often attended with prodigious Exploſions, and Earthquakes, *from great Quantities of Nitre, as in ſpringing a Mine.*

The Doctor proceeds to ſhew, that Nitre, which is the Cauſe of thoſe Exploſions, is alſo the chief Agent in the Generation of Hail; and that as Hail is very often an Attendant of Thunder and Lightning, ſo it might be ſcatter'd by thoſe Exploſions, like Small-ſhot out of a Gun, and cauſe thoſe Holes which are ſaid to be found in the Cloaths and Fleſh of Perſons, who have been killed or hurt by Lightning; of which many Inſtances might be produced. See Philoſ. Tranſ. 236. p. 5. Lowth's Abridgm. Vol. II. p. 177.

Thus have we given a ſuccinct Account of what the Learned have alledg'd to be the Cauſe of Earthquakes; *which we judg'd neceſſary for the Inſtruction of our Readers in their Peruſal of the following Sheets.*

A DESCRIPTION OF THE TOWN *and* PORT OF CALLAO.

PREVIOUS to the Account which we are about to give of the dreadful *Earthquake* which happen'd at *Callao* and *Lima* in the Year 1746, it may be neceſſary to give ſome ſhort Deſcription of thoſe Places, as they were before that Calamity befel them. And firſt, of *Callao*.

This Town was built on a low flat Point of Land, at the Edge of the Sea; ſo that the Level is not more than nine or ten Feet above High-Water Mark, which does not riſe and fall over four or five. However, it ſometimes exceeds to ſuch a Degree, that it floods the Out-ſkirts of the Town, as happen'd in *September* 1713; from whence, ſays Frezier, *it is to be fear'd*, it may, ſome Time or other, deſtroy

deſtroy the ſame; which Prediction hath lately been too fatally verified.

As to the Aſtronomical Situation of this Place, *Frezier* puts it in 12 Degrees, 7 Minutes of South Latitude: Hence, as it ſtands about two Leagues South-weſt of *Lima*, we may compute its Longitude or Meridian Diſtance from *Paris*, to be about 79 Degrees, 24 Minutes Weſt, and from *London* 76 Degrees, 59 Minutes.

Callao was much longer than broad. The Streets were all in a Line, but did not, for the general, interſect each other at right Angles, nor divide the Town into the uſual Dimenſions or common Squares obſerved in other Places. They were likewiſe ſo intolerably duſty, that there was no walking in them with any Satisfaction. The Houſes were, for the moſt part, of but one Story. By the Sea-ſide ſtood the Governor's Houſe, and Palace of the Vice-Roy; which two Buildings took up two Sides of a Square; the Pariſh-Church making the third, and a Battery of three Pieces of Cannon the fourth. In the ſame Street, on the North-ſide, were the Ware-houſes for Commodities which the *Spaniſh* Ships brought from *Chili*, *Peru* and *Mexico*; alſo another for laying up *European* Commodities, which they call *La Adminiſtracion.*

Beſides theſe few publick Structures, there were *none of any* Note, except the Churches, which

which were built only with Cane, interwoven and cover'd with Clay or Timber painted white. There were alſo five Monaſteries, belonging to the *Dominicans*, *Franciſcans*, *Auguſtins*, *Mercenarians*, and *Jeſuits*; beſides the Hoſpital of St. *John of God*.

Frezier tells us, that the Number of Inhabitants in 1714, did not exceed 400 Families, though they reckon'd 600, according to *Fuillée*; which, at Eight to a Family, falls but 200 ſhort of the Number aſſign'd by the Narrative at the Time of the *Earthquake* in 1746. *Fuillée* ſays, they were almoſt all Seamen, and, for the moſt Part, without either Politeneſs or Civility.

Without the Walls of *Callao* were two *Indian* Suburbs, both call'd *Pitipiti*, but diſtinguiſh'd by the Names of the *Old* and *New*; the firſt on the South, the other on the North Side; through which runs the River of *Rimak*, or of *Lima*.

The Town would be agreeable enough, if the Heats, which continually rage there, were but temper'd now and then with Rain, which never falls along this Coaſt. To the Eaſtward of this Place is nothing to be ſeen but large Plains adorn'd with handſome Country Houſes; to which belong fine Orchards water'd by Canals cut from the River. In theſe Orchards one meets with ſeveral Kinds of Fruit-trees, the moſt numerous of which are thoſe

thoſe which bear Olives, much larger than the *European*. Beſides theſe, and Orange and Citron Trees, there are none but what are peculiar to the Country, as *Fuillée* obſerves.

Callao was fortified in the Reign of King *Philip* IV. with an Encloſure flank'd with ten Baſtions on the Land-ſide; and by ſome redant and plain Baſtions on the Edge of the Sea, where there were four Batteries of Cannon to command the Port and Road.

The Rampart was of two different Breadths; the Curtains at Top but eight Feet thick, two and a half of Earth, as much Banquette, and three of Stone ſet in Mortar. The Rampart of the Baſtions had five Fathoms of Earth, laid with unequal Planks, to ſerve as a Platform for Cannon; the Whole unſolid, becauſe ill built. The Baſtions were vaulted, and had their Magazines of Powder, Ball, and other military Stores for the Service of the Artillery, which conſiſted of two, three, or four Pieces of Cannon; when *Frezier* was there, the whole Number amounted to forty-one, but of ſeveral Sizes, from 12 to 24 Pounders, *Spaniſh* Weight.

The Land-Forces of *Callao* conſiſted of ſeven Companies of *Spaniſh* Foot, of 100 Men each. The Garriſon was compoſed of 600 Foot. But altho' the King of *Spain* had ſettled a Fund of 292, 171 Pieces of Eight a Year, for maintaining of this Garriſon, yet

when

when *Frezier* was there, there were ſcarce Soldiers enough to mount the Guard at the Place of Arms.

I ſhall not lengthen this Account by enumerating the ſeveral Officers, Civil and Military, in this Port, together with their ſeveral Salaries and Appointments; nor deſcribe the Trade carried on with the Inhabitants of *Chili* and *Mexico*, and all Parts of *Peru*, and likewiſe with *Europe*; let it ſuffice to ſay, that it was very conſiderable.

Callao Port is about eight Leagues South-Eaſtward of *Chancay*, and 21 North North-weſt of *Caniate*, two other Ports mention'd in the following Narrative of the *Earthquake*. It lies in a kind of Bay formed by the Iſland of St. *Laurence* and the Rocks *de los Piſcadores*, five Leagues diſtant to the North North-weſt, but about two from the Continent, and three South of *Chancay*. The Iſland of St. *Laurence* ſhelters this Port from the South and Weſt Wind, which laſt is the moſt dangerous one that blows here, and breaks the Surges that come from the South-Weſt.

Frezier obſerves, that the Road of *Callao*, which lies to the Weſt of the Town, is the largeſt, fineſt, and ſafeſt in all the *South-Sea*. There is Anchorage every where, in as much Depth of Water as every one likes, on an Olive-colour'd Owze, without Danger of Rocks or Shoals; excepting one, which is three

three Cables Length from the Shore, about the Middle of the Iſland of St. *Laurence*, oppoſite to *Gallera*, a Place where private People ſend their Slaves when they offend them. This Iſland, *Duret* ſays, was formerly inhabited by People whoſe Lord was much fear'd and reſpected by his Subjects: He was ſo jealous, that all his Domeſticks, as well as thoſe who guarded his Women, were Eunuchs; nay, theſe latter had their Noſes cut off, that his Concubines might not take a Liking to them.

The Sea is there always ſo ſtill, that Ships careen at all Seaſons, without fearing to be ſurpriz'd by any ſudden Guſts: However, it is open from the North to the North-weſt; but thoſe Winds hardly ever blow above a ſmall eaſy Gale, which does not cauſe the Sea to ſwell to any Danger.

The Point of *Callao*, before-mention'd, is a low Slip of Land, a little to the South or South-weſt of the Town; and between it and the Iſle of St. *Laurence* is a narrow Gut or Paſſage, call'd the *Boqueron*, or *Mouth*, which lies North-weſt and South-eaſt.

In the Port of *Callao* are found all Conveniencies and Neceſſaries for Navigation. The Watering is eaſy at the little River of *Lima*, which falls under the Walls of *Callao*. Wooding, however, coſts more Trouble, being half a League to the Northward, at *Bocanegra*.

They

They cut the Wood half a League up the Country, and pay the *Jeſuits* 25 or 30 Pieces of Eight for each Boat-full. For the Conveniency of landing out of the Boats, there are, cloſe by the Walls, three Wooden Stairs and a Stone-Mole; deſign'd for the unlading of Cannon, Anchors, and other Things of Weight, which are hoiſted up by a Sort of Crane.

This Part of *Callao* is never without much Shipping. Beſides, the King of *Spain* always keeps three Veſſels there, and two or three Galliots.

The *Spaniards* at *Lima* have Servants in the Country, who are employ'd to trade with the *Indians* for Gold; and here the Plate-Fleet, which carries the Treaſure both of the King and Merchants, has its Rendezvous before it ſails for *Panama*, as it always does, when the *Spaniſh Armada* comes to *Porto-Bello*. This *Armada* arrives at *Cartagena*, whence an Expreſs is immediately ſent over Land to *Lima*, thro' the Southern Continent, to give Notice of its Arrival, and haſten the King's Treaſure; upon which the Vice-Roy immediately ſends it away to *Panama*, where it is landed, and lies ready to be ſent by Land to *Porto-Bello*, on the firſt News of the *Armada*'s Arrival there, in order to be carried to *Europe*.

It requires ſome Time for the *Lima* Fleet to unlaid, becauſe the Ships ride not at Pana-

ma, but at *Perica*, an Iſle two Leagues off. The King's Treaſure is ſaid to amount commonly to 24 Millions of Pieces of Eight, beſides Abundance of Merchants Money and Goods; all which is carried on Mules.

From this Port is ſent, every Year, a Veſſel to *Acapulco*, with Quick-ſilver, Cacao and Pieces of Eight. She arrives commonly a little before *Chriſtmas*, and ſtays till the coming of the *Manila* Ship; when ſhe takes in Spices, Silks, Callicoes, Muſlins, and other *Eaſt-India* Commodities for the Uſe of *Peru*, and then returns to *Callao*. She carries only 20 Guns; but her Lading is extremely rich, both outward and homeward-bound.

When Sir *Francis Drake* arrived here the 15th of *February*, 1578, he found 30 Ships in the Port. But although 17 of them were the beſt in the *South-Sea*, and all ready provided, yet that Hero had the Courage, with only one Ship and a Pinnace, to enter into the Midſt of them, and anchor all Night. Here, if he had been revengeful, he had an Opportunity of gratifying his Paſſion to the full; and might have done the *Spaniards* more Miſchief in a few Hours than they could have recover'd in many Years. However, if he ſpared them one Way, by not making Repriſals in Blood for their Cruelty to the *Engliſh*, he took Satisfaction, at leaſt, in ſome Meaſure, another Way: For underſtanding that there

there was a Ship among them belonging to one *Michael Angelo*, wherein were 15,000 Bars of Silver, and a Cheſt full of Rials of Plate, beſides Silk and Linen, he ſingled her out, and made her Prize.

This Ship was a ſufficient Recompence for all their Labours: But it was nothing in Compariſon to the Reward which Fortune had in Store for them: For here he got Intelligence of the Ship *Cacafogo*, the Glory of the *South-Sea*, laden with Gold and Silver from *Chili* and *Peru*, which had ſailed for *Panama*, where that Treaſure is landed, in order to be carried, by Way of *Cartegena*, to *Europe*. And altho' ſhe had ſet out fourteen Days before, yet the 16th, early, he put to Sea, in Hopes of overtaking her. In the Way he ſnapped up a Veſſel from *Guaiaquil*, laden with 80 Pound Weight of Gold; and and on the Firſt of *March*, at Cape *Franciſco*, one Degree to the North of the Line, came up with this wealthy Prize. They found in her a large Quantity of Jewels and precious Stones, 13 Cheſts of Ryals of Plate, 80 Pound Weight of Gold, 26 Tun of unrefined Silver, two very large Silver drinking Bowls, and other Riches.

A Deſcription of LIMA, *the Capital of* PERU.

LIMA is two Leagues diſtant from *Callao*; from which Port the Road begins on the North Side from the new Suburb, is good and pleaſant, along a fine Champain. Mid-way is a Chapel of St. *John of God*, called *La Legua*, or *the League*; and three Quarters of a Mile beyond, the Road parts into two Branches; that on the left Hand leads to the Royal Gate of *Lima*; the other to that called *Juan Simon*, which anſwers to the Middle of the City.

This Plain is full of very neat Country Houſes, with Fruit both indiginous and foreign. It is moſtly taken up with Alfarfars, that is, Fields where they ſow a Grain which produces a Plant call'd *La Sern* or *Medica* (becauſe the Seed came firſt from *Media*.) It bears liguminous Flowers, whoſe Stalk is about two Feet long, and divided towards the Top into ſeveral Branches, loaded with little blue Flowers, which, when blown, give thoſe Plains a moſt beautiful Aſpect. As ſoon as theſe Plants, call'd alſo Alfarfars, are cut, others ſhoot forth. Every Morning one ſees vaſt Numbers of Aſſes loaded with them, en-

ters

ter *Lima*, with each a Bone in his Mouth, to prevent their eating them.

To the South of *Lima* is the Valley of *Pachakamok* (the Name of the unknown God whom the *Indians* ador'd in their Hearts) where are ſtill ſeen the Remains of the ſuberb Temple built in Honour of that Divinity. Hiſtorians report, that *Ferdinand Pizarro* found there, over and above the Pillage made by the Soldiers, 900,000 Ducats, which the *Indians* had not Time to hide with the Gold and Silver which they carried off on the Approach of the *Spaniards*.

As to the Situation of *Lima*, Aſtronomers have fix'd it but with a ſmall Variation from that of *Callao*; yet even in this they differ ſo much, that *Fuillée* adviſes Aſtronomers to chuſe ſome other Place than *Lima* to make their Obſervations; for that the Sun ſeems not to be made for the Inhabitants, to whom it is viſible ſcarce three Months in the Year.

This City, according to *Frezier*, is built at the Bottom of a Vale, formerly call'd *Rimak*, from a noted Idol of the *Indians*, which was famous for Oracles, whence, by Corruption, and thro' the Difficulty thoſe People found in pronouncing the Letter R, as harſhly as the *Spaniards*, came the Name of *Lima*; which is quite different from that given it by its firſt Founder, *Francis Pizarro*, who calls it *La Ciudad de los Reges*, or *the City of the Kings*; meaning the three wiſe Men who came out

of the Eaſt to worſhip Chriſt new-born; perhaps becauſe the *Spaniards* conquer'd that Vale on the Day of the *Epiphany*, as many pretend. *Fuillée* ſays that Name was given to it on its having been founded on the Day of *Epiphany*, in the Year 1534; but *Frezier* affirms, that this happen'd on the 18th of *January* 1535, the Feſtival of St. *Peter*'s *Chair*.

This Epocha is alſo determin'd by the Reaſons *Pizarro* had for building a City in the Place where *Lima* now ſtands: For *Herrara* tells us, that the Lord Lieutenant, Don *Pedro de Alvarado*, advancing with an Army from *Guatemala* to *Peru*, with a Deſign to make himſelf Maſter thereof; *Pizarro* came to make a Settlement in the Vale of *Lima*, near the Port of *Callao*, which is the beſt on the Coaſt, to obſtruct his arriving by Sea, whilſt Don *Diego de Almagro* march'd by Land to oppoſe him in the Province of *Quito*.

The *Spaniards*, before they erected any Structure, laid the Foundations of the Church, much about the Midſt of the City. *Pizarro* laid down the Streets, and diſtributed the Spaces for the Houſes, by Quarters, of 150 Varas, or *Spaniſh* Yards, that is, 64 Fathoms ſquare. Afterwards, twelve *Spaniards*, who were Citizens, began to build for themſelves after his Direction. Theſe were join'd by thirty more from *San Gallan*, and ſome others who liv'd at *Xanxa*, amounting in all to 70 Inhabitants; from which inconſiderable Be-

ginning it increaſed to be the largeſt City in all *South-America*.

The Diſtribution of the Plan is very beautiful. The Streets are in a direct Line, and of a convenient Breadth. In the Midſt of the City (but near the River) were to be found together all Things for the publick Service. The Eaſt Side was taken up by the Cathedral, and the Archbiſhop's Palace; the Weſt by the Council-Houſe, the Court of Juſtice, the Priſon, and the Guard-Chamber, with a Row of uniform Porticos and Shops.

In the Midſt of the Square was a Braſs Fountain, adorn'd with the Statue of *Fame*, and eight Lions of the ſame Metal, contriv'd to ſpout all about. At the Angles were four other little Baſons, very rich in Metal.

One Quarter from the Royal Square, on the North Side, runs the River of *Lima*, which is almoſt always fordable, except in Summer, when the Rains fall on the Mountains, and the Snows thaw. There are Trenches drawn from it in ſeveral Places, to water the Fields, as well as the Streets and Gardens within the City, whither it is convey'd in cover'd Paſſages.

A little to the North of the Vice-Roy's Palace this River is cover'd with a Stone Bridge of five Arches, which communicates with a great Suburb, call'd by the *Indians*, *Melambo*, and by the *Spaniards*, *Lazaro*. Large Canals that paſs *thro' the* Suburb, turn ſeveral Corn

and

and Powder Mills, and water ſeveral Gardens, whoſe Fruit is excellent, eſpecially the Figs and Grapes. The principal Street is near a League in Length, and leads directly to the Church of the Suburb, and terminates near the *Alamedo*; which is a Walk of five Rows of Orange Trees, about 200 Fathom long; the broadeſt of the Walks between them being adorn'd with three Stone Baſons for Fountains. The Beauty of thoſe Trees always green, the ſweet Odour of the Flowers laſting almoſt the whole Year, and the Concourſe of Calaſhes daily reſorting thither about Five in the Evening, the Time of taking the Air, make this Walk a delightful Place.

About the Middle of it is a Chapel, call'd the *Invocation of St. Liberata*, built in the Year 1711, in a Place where the holy *Ciborium* of the Cathedral, which had been ſtolen and buried under a Tree, was found. This *Ciborium* is the Pix, Box, or Cup, wherein the Hoſt, or conſecrated Wafers are kept in Popiſh Churches. That little Walk terminates at the Foot of the Mountain, wherein was a Monaſtery of the *Obſervants*, reform'd by St. *Francis Solano*, a Native of *Paraguay*, contiguous with that Mountain. Eaſtward is another call'd St. *Chriſtopher*'s, on which is the Hermitage of that Saint; at the Foot whereof runs a Branch of the River, whoſe Streams drive ſeveral Corn-Mills, and one Powder-

Powder-Mill, and is the common bathing Place.

One ſees very few Houſes at *Lima*, of two Stories, except thoſe in the great Square; the *Earthquakes* having taught the Inhabitants, that thoſe ſumptuous Buildings, raiſed with ſo much Magnificence by the firſt Founders of that City, ſerved only for Sepulchers to their Anceſtors. The *Spaniards* were forewarned of this by the *Indians*, who made a Jeſt of their great Deſigns. However, the Dread of *Earthquakes* had not hinder'd them from building of many fine Churches, and high Steeples at *Lima*. Moſt of the Arches, indeed, are made of Timber, or Cane-work; but ſo well order'd, that no Man can diſcern it, unleſs he is told it. The Walls of the great Structures are of burnt, and thoſe of the leſſer of unburnt Bricks.

The Houſes have only a Ground-floor, though ſometimes an upper Story made of Canes, that it may be light; and are all without Roofs, becauſe it never rains there; being only cover'd with a ſingle Mat, and the Thickneſs of a Finger of Aſhes laid on it, to ſuck up the Moiſture of the Fogs, and alſo to prevent being cruſh'd by the Fall of the Roof in Caſe of *Earthquakes*.

Duret ſays, the Houſes are very magnificent, and take up much Room, being 80 Foot in Front, and twice as much in Depth. One enters firſt by a large handſome Gate in-

to

to a large Court, where there are many Chambers and Apartments. In the Middle of this Court is another Gate, thro' which one has a Proſpect of the *Jets d'eau*, and Fountains of the Garden.

The Walls of the Houſes are faced on both Sides with Brick, and the middle Space fill'd with Earth five Feet in Thickneſs; in order to raiſe the Chambers the higher, and make the Windows a good Diſtance from the Ground, to prevent thoſe in the Street from looking in. The Stairs are open towards the Court, and lead to Galleries, which ſerve for Corridores, or Walks, to go into the Apartments. The Roofs are made of rough Pieces of Timber, hid from View on the Inſide by painted Mats, or Cloths tack'd to them; which has an agreeable, as well as a ſurprizing Effect, on thoſe who are not accuſtomed to ſuch Decorations.

Upon the Roof on the Outſide, they lay Branches of Trees with the Leaves on, which they renew from Time to Time. The Apartments being thus ſhelter'd from the Sun, are cool in the moſt violent Heats. But as this Author *(Duret)* differs ſo much from others, with Regard to the Covering of the Houſes, there is Room to ſuſpect what he ſays in Relation to the Dimenſions and Manner of Building.

The Walls of the City, and their Baſtions, which ought to be an everlaſting Work, are

no

no otherwiſe built. They are between 18 and 25 Feet high, and nine in Thickneſs at the Cordon; ſo that, in all the Compaſs of the Town, there is no one Place broad enough to mount a Cannon; which made *Fuillée* and *Frezier* believe, they were built only to oppoſe any Attempts of the *Indians*. According to the laſt Author, the Flanks of the Baſtions are about 15 Fathoms perpendicular with the Curtin, and the Faces about 30, which makes the Angle of the Epaule 130 Degrees. This occaſions ſuch a fichant Defence, that two Thirds of the Curtin are upon a ſecond Flank; and the flank'd Angles are often too acute. Thoſe Curtins being about 80 Fathoms in Length, the great Line of Defence is of about 110. Beſides this, there is neither Ditch nor Outworks. Theſe Fortifications were raiſed about 1685, in the Viceroyſhip of the Duke of *de la Polata*, by one *Don John Ramond*, a *Flemiſh* Prieſt.

The *Spaniſh* Families in *Lima* amount to about 8 or 9000 Whites, the reſt are only *Meſtigoes*, *Mulattos*, *Blacks*, and ſome *Indians*: Theſe Inhabitants make, in the whole, about 25 or 30,000 Souls, including the Friars and Nuns, which take up, at leaſt, a Quarter of the City.

Both Sexes are inclinable to be coſtly in their Dreſs. The Women, not ſatisfied with the Expence of the richeſt Silks, adorn themſelves with a prodigious Quantity of Lace,

and are inſatiable as to Pearls and Jewels, for Bracelets, Pendants, and other Ornaments, the making whereof ruins both the Huſbands and Gallants. *Frezier* ſaw Ladies, who had about them above the Value of 60,000 Pieces of Eight in Jewels.

They are generally beautiful enough, of a ſprightly Mein, and more engaging than in other Places; though, perhaps, their Beauty is, in Part, owing to the hideous Faces of the *Mulattos*, *Blacks*, and *Indians*, which ſerve as Foils to them.

They reckon at *Lima* no fewer than 4000 Calaſhes, drawn by Mules, which are the common Carriages for the Gentry, and other People of Condition, in that Country. By this one may judge of the Magnificence of the Inhabitants, as we do in *European* Cities by the Number of Coaches.

But to give ſome Idea of the Wealth of that City, it may ſuffice to relate what Treaſure the Merchants there expoſed about the Year 1682, when the Duke *de Plata* made his publick Entry as Viceroy. They cauſed the Streets called *de la Mereed*, or of *Mercy*, and *de los Mecadoces*, extending thro' two of the Quarters (along which he was to paſs to the Royal Square, where the Palace ſtands) to be pav'd with Ingots of Silver, that had paid the Fifth to the King. An Ingot generally weighs 200 Marks, of eight Ounces each, are between 12 and 15 Inches long, 4 or 5 in Breadth,

Breadth, and 2 or 3 in Thickneſs. The Whole might amount to the Sum of 80 Millions of Crowns.

Lima is, in ſome Sort, the Repoſitory of the Treaſures of *Peru*, whoſe Capital it is. It was computed, ſome Years ago, that about ſix Millions of Crowns were expended there: But a large Abatement muſt be made at preſent, ſince the *French* have carried thither the Commodities of *Europe* at an eaſy Rate; and the Trade they have driven at *Arica*, *Hilo*, and *Piſco*, has diverted the Plate that came formerly to *Lima*, which is the Reaſon that *Lima* is now poor for what it formerly was.

Lima is the uſual Reſidence of the Viceroy of *Peru*, who is no leſs abſolute than the King of *Spain* himſelf in the Courts of that City, and at *Chuquiſata*, *Quito*, *Panama*, *Chili*, and *Tierra Firma*, as being Governor and Captain General of all the Kingdoms and Provinces of that Part of the *New World*. His Allowance is 40,000 Pieces of Eight yearly, excluſive of his extraordinary Perquiſites. Thus when he goes in Progreſs into any of the Provinces, he is allow'd 10,000 Pieces of Eight, and 3000 for going only to *Callao*, which is but two Leagues diſtant. He has the Nomination of one Hundred Carregidores, or ſupreme Magiſtrates of conſiderable Places, and, in ſhort, of all triennial Employments, both Civil and Military.

It is to be obſerv'd, that moſt Employments are given or ſold only for a limited Time. Thoſe of the Viceroys and Preſidents are generally held ſeven Years; ſome Corregidores and Governors have theirs for five, and the greater Number but for three. It is eaſy to ſee, that this Regulation was made, to prevent their having Time to gain Creatures, and form Parties againſt a King, who is ſo very remote from them, that it requires Years to receive his Orders. This Policy, however, has its Inconveniencies, and is the Cauſe of the ill Government of that Province; for the Officers are ſure to make the moſt they can of their Places in the ſhort Time they are to hold them.

The Viceroy's uſual Guard is compos'd of a Company of Halbadiers, a Troop of Horſe, and a Company of Foot, each conſiſting of 100 Men. The two laſt are paid by the King, and the Halbadiers are maintain'd out of a Fund left by a very rich Lady of *Lima*. There is another Company of 50 ſelect Perſons, all Men of Diſtinction, who walk by his Side when he makes his publick Entry. There is a Chaplain in his Palace, ſerv'd by ſix Chaplains, a Sacriſtian, and a Choir of Muſick, paid by the King.

The Garriſon of *Lima* conſiſts only of the Militia who have no Pay from the King, except the General Officers, and the Serjeants of

of the Foot Companies, which are in all Fory-five.

It is ſaid, that, upon an Emergency, the Viceroy can raiſe 100,000 Foot, and 20,000 Horſe, thro' the whole Extent of the Kingdom: But it is certain, that he could not arm the fifth Part of them.

In *Lima* are appointed many Courts for the Adminiſtration of Juſtice, and other Purpoſes, but it would be too tedious to give a particular Deſcription of them all; and therefore we ſhall only take Notice of that of the Inquiſition, whoſe Name alone ſtrikes a Terror every where; becauſe, firſt, the Informer is reckon'd as a Witneſs; ſecondly, the Accuſed are not allow'd to know their Accuſers; thirdly, there is no confronting of Witneſſes; ſo that innocent Perſons are daily taken up, whoſe only Crime is, that there are ſome People whoſe Intereſt it is to ruin them. However, they ſay at *Lima*, that they have no Cauſe to complain of the Inquiſition; perhaps becauſe the Viceroy and the Archbiſhop are at the Head of that Body.

The Inquiſition was ſettled there in the Year 1569, with all the Miniſters, Counſellors, Qualificators, Familiares, Secretaries, and chief Serjeants, as it is in *Spain*. It has three ſuperior Judges, who have 3000 Pieces of Eight Salary; and their Juriſdiction extends throughout all the *Spaniſh South-America*.

In order to furniſh ſuch a Number of Courts as there are in *Lima*, with Perſons properly qualified, the Emperor *Charles* V, in in 1525, founded an Univerſity there, under the Title of St. *Mark*, and granted ſeveral Privileges; which were confirm'd by Pope *Paul* III, and *Pius* V, who, to enlarge them in 1572, incorporated it into that of *Salamanca*. It is governed by a Rector, who is choſen yearly. They reckon in it about 180 Doctors of Divinity, Civil and Canon Law, Phyſick, and Philoſophy, and generally near 2000 Scholars. Some proceed from thence, able enough in the ſcholaſtick and tricking Part, but very few in the practic.

Lima contains eight Pariſhes, twelve Hoſpitals, beſides a Houſe of Charity for poor Women, where poor Maids are married, or made Nuns; alſo a Foundation of above 600,000 Pieces of Eight, left by a Prieſt, to marry 20 Maids, with a Portion of 500 Pieces of Eight with each; the *Brotherhood of Conception* marries forty, after the Rate of 450 Pieces of Eight each.

The Monaſteries (before the *Earthquake*) took up the fineſt and largeſt Part of the City. The *Dominicans* had four Monaſteries; the *Franciſcans* four; the *Auguſtins* had four; the *Mercenarians* had three; the *Jeſuits* five; the *Benedictines* one; the *Minims* one; the *Brothers of St. John of God* had the Direction of the Hoſpital of St. *James*; the *Bethlemites* had

had two Hoſpitals at *Lima*, and nine Monaſteries in *Peru*. Theſe good Friars, though to outward Appearance very ſimple, are reckon'd refin'd Politicians, as may be judg'd by the Name of the *Quinteſſence of Carmelites* and *Jeſuits*, given them by the People. They chuſe for their Chaplain a ſecular Prieſt, whom they keep in their Houſe at a certain Allowance; but he has no Vote among them. They are clad like the *Capuchins*, excepting that under their Beard they have a Bib a Quarter of a Yard long, ending in a Point. Their Founder, as thoſe good Friars give out, had, eleven Years together, the Company of our Saviour viſibly carrying the Croſs. The other Apparitions and Revelations, which they place to his Account, and publiſh both by Word of Mouth, and by Pictures, are of the ſame Reputation.

The Nuns are not quite ſo numerous at *Lima* as the Friars; there were only twelve Monaſteries of them, which contain about 4000 Nuns, among whom there are four or five Monaſteries of very regular religious Women; but the Friars are much more numerous.

To theſe we may add a Houſe founded by the Archbiſhop *Toribio* for Women divorced. It is incredible, ſays *Frezier*, to what an Exceſs that Abuſe has been carried. There are People daily unmarried, with as much Eaſe *as if Marriage* was nothing but a civil Contract

tract, upon bare Complaints of Misunderstanding, Want of Health, or Content of Mind; and what is still more amazing, they afterwards marry others.

The penitent Women had also a Place of Retreat, but *Frezier* did not think it sufficiently fill'd with them; which he imputes to the little Scruple they make in that Country of Libertinism, or the little Care there is taken to curb it.

By the great Number of Monasteries and religious Houses of both Sexes, one wou'd imagine *Lima* to be a Place much addicted to Devotion; a great Mistake! For most of the Friars are so given to Licentiousness, that even the Superiors and Provincials draw from the Monasteries considerable Sums of Money, to defray the Expences of worldly Pleasures, and sometimes of such open Lewdness, that they make no Scruple to own the Children they have gotten, to keep about them those undeniable Proofs of their disorderly Life, to whom they often leave, as an Inheritance, the Habit they are clad in, which sometimes descends beyond one Generation.

The Nuns likewise, except of three or four Monasteries, have no more than an Appearance of the Regularity, which they only owe to the Inclosure: For, instead of living in Community and Poverty, according to their Vow, they dwell apart at their own Cost; with a great Retinue of *Black* and *Mulatto*

Women

Women Slaves and Servants, whom they make ſubſervient to the Gallantries which they carry on at the Grates.

To do the *Jeſuits* Juſtice, both *Frezier* and *Fuillée* except them out of the Number of irregular Regulars, declaring, that they live after a more exemplary Manner; they do not, however, yield to any of the other Orders in Point of Wealth.

To give the Reader ſome Idea of the Superſtition of the *Romaniſts* in that Country, we ſhall divert him with an Account of the Feaſt of St. *Francis* of *Aſſiſium*, which is none of the leaſt in the Year; and was celebrated at *Lima* the 4th of *October* 1713, two Days after *Frezier*'s Arrival there; for the *Spaniards* being poſſeſſed and infatuated by the Friars, eſpecially the *Franciſcans* and *Dominicans*, look upon the Founders of theſe two Orders as the greateſt Saints in Heaven. The Veneration they pay them extends to the Habits of their Orders, which they eſteem much beyond the other Monaſtical Orders.

They chiefly believe, that they obtain great Indulgences by kiſſing the Habit of St. *Francis*. The *Franciſcans*, to keep up that Notion, ſend ſome of their Friars into ſome of the moſt frequented Churches, to give their Sleeves to kiſs to thoſe who are hearing Maſs. Even the Queſting Brothers preſume to interrupt People in their Prayers, to have that *Honour done* them. But, to heighten the

general Reſpect paid to their Order, and render its Grandeur more conſpicuous to the Publick, they, on the Feſtival of their Founder, make magnificent Fire-works and Proceſſions, and embelliſh their Cloiſters, within and without, with the richeſt Things they can come at.

The Feſtival began at the Evening Song, by a Proceſſion of the *Dominicans*, in which ten Men carried the Figure of St. *Dominick*, going to viſit his Friend St. *Francis*. He was clad in rich Gold Stuffs, and glittering with ſmall Stars of Silver, ſtrew'd upon him, that he might be ſeen at a Diſtance. St. *Francis* being inform'd of the Honour his Friend intended him, came to meet him as far as the Square, which is half Way. Being arriv'd before the Palace-Gate, they complimented one another by the Mouths of their Children; for though they made Geſtures, they had not the Advantage of ſpeaking. The Latter, being more modeſt than the Former, came in his *Franciſcan* Friar's Cloth; but, amidſt that Poverty, he was encompaſſed by an Arch of Silver Rays; and had, at his Feet, ſuch a Quantity of Gold and Silver Veſſels, that 18 Men bow'd under the Load of them.

The two Images were receiv'd at St. *Francis*'s Church-door, by four Giants of different Colours, White, Black, Mulatto, and *Indian*, which came to the Square to dance before the *Proceſſion*. They were made of Baſket-work, cover'd

cover'd with painted Paper; but in Fact, to conſider their Figure, Maſks, Hats, and Perukes, were mere Scarecrows. In the Midſt of the Giants was the *Taraſka*, a chimerical Monſter, known in ſome Provinces of *France*, bearing on its Back a Baſket, from which iſſued a Puppet, or Maulkin, that danced and ſkipped to divert the People. At length they enter'd the Church, amidſt a great Number of Tapers and little Angels, two or three Feet high, ſet on Tables, like Puppets, among large Candleſticks, each the Height of ſix or ſeven Feet.

At the Cloſe of the Evening, there were Fire-works in the Square before the Church, conſiſting of three Caſtles, each 8 or 9 Feet wide, or 15 or 16 in Height. On the Foot of one of them was a Bull, and on another a Lion. The Steeples of the Church were adorned with Enſigns and Streamers of all Colours, and illuminated with Lanthorns. They began with throwing up Sky-rockets, ſmall and ill made. Then they play'd off ſome running Fires, one of which ſeparated in three long Squibs, which reſted on the Middle and two Ends of the Line, leaving two little Globes of bright Fire in the two intermediate Spaces. This was the only Fire-work that deſerv'd to be taken Notice of. At laſt a Man on Horſeback deſcended from a Steeple by a Rope, and came to attack, in the Air, one of their Caſtles; *then* they ſet Fire to it, and ſucceſſively

ſively burnt the Giants, and the *Taraſka*, or Monſter; and ſo all was reduced to Aſhes.

Next Day there was a long Sermon, and Muſick, accompanied with Singing of *Spaniſh Motetts*. The Monaſtery was open'd alſo to the Women; and at Night another Proceſſion carried St. *Dominick* home. On which Occaſion, altho' it was Day, there was another Fire-work, where a Giant came down by a Rope, to attack a Caſtle, and fight a Serpent with three Heads. But in their Shews there is neither Fancy, Deſign, nor Subject; which ſhews what little Taſte and Genius there is among them.

The Magnificence of theſe Solemnities, ſhews in how great Eſteem thoſe Friars are, ſince, by Means of their Wallets, or begging, they get enough not only to maintain above 1500 Perſons, as well as Friars or Servants, in four Monaſteries, and to erect Structures truely ſumptuous for that Country, (the Monaſtery of St. *Francis* being the fineſt and largeſt in all *Lima*) but we ſee have enough left for Expences of mere Oſtentation; which have ſometimes amounted to 50,000 Pieces of Eight, out of what is properly the Right of the Poor, of whom there is no Want there.

One need not, however, be ſurpriz'd at theſe Expences, if we conſider the extraordinary Product of the Queſt; ſince the great *Monaſtery*, alone, has twenty-four Queſtors

at *Lima*; one of whom, who died in 1708, had, in 20 Years, gather'd 350,000 Pieces of Eight. Beſides, it is very common, among the *Spaniards*, to wrong their neareſt Relations of conſiderable Sums of Money, and even of their lawful Inheritance, in Favour of the Church and their Monaſteries, which they call, *Making their Soul their Heir.*

An Account of the EARTHQUAKE, *which happen'd at* Lima, *in the Night of the* 28*th of* October, 1746.

THE Kingdoms of *Peru* and *Chili* are extremely ſubject to *Earthquakes*: But of all which have happen'd ſince the Conqueſt made of thoſe Countries by the *Spaniards*, it may be truely affirm'd, that none ever broke out with ſuch aſtoniſhing Violence, or hath been attended with ſo vaſt a Deſtruction, as that which happen'd lately in this Capital, where, undoubtedly, it had its Origin, and from thence was propagated an hundred Leagues Diſtance Northwards, and as many more to the South all along the Sea-coaſt. This ſurprizing Convulſion of the Earth arriv'd in the Night of the 28th of October,

tober, 1746, a Day dedicated to St. *Simon* and St. *Jude*.

According to the beſt regulated Clocks and Watches, this fatal Cataſtrophe befel this Place 30 Minutes after Ten at Night; when the Sun was in five Degrees ten Minutes of *Scorpio*, and the Moon in not much leſs of *Taurus*; ſo that thoſe Planets wanted very little of being in Oppoſition, as they actually were in five Hours and twenty-two Minutes afterwards, *viz.* at Three of the Clock, and fifty Minutes on the 29th in the Morning; an Aſpect which, by conſtant Obſervation, hath prov'd unfortunate in this Climate: For, under its Influence, theſe convulſive Kinds of Agitations in the Earth do moſt uſually happen; and tho' they often prove gentle enough, yet every now and then they ſtrike Terror in the Natives by their violent Shocks. But, on this Occaſion, the Deſtruction did not ſo much as give Time for Fright; for, at one and the ſame Inſtant, almoſt, the Noiſe, and the Shock, and the Ruin were perceiv'd together; ſo that in the Space of four Minutes, during which the greateſt Force of the Earthquake laſted, ſome found themſelves buried under the Ruins of the falling Houſes; and others cruſh'd to Death in the Streets by the tumbling of Walls, which, as they ran here and there, fell upon them. However, the major Part of them happen'd to be preſerv'd, either in the hollow Places *which the* Ruins left, or on Top of the very

Ruins

Ruins themſelves, without knowing how they got up thither; as if the Divine Providence had thus conducted them, that they might not periſh: For no Perſon, at ſuch a Seaſon, had Time for Deliberation; and even ſuppoſing he had, there was no Place of Retreat in which to truſt. For the Parts which ſeemed moſt firm, ſometimes proved the weakeſt; on the contrary, the weakeſt at Intervals made the greateſt Reſiſtance; and the general Conſternation was ſuch, that no one thought himſelf ſecure, till he had made his Eſcape out of the City.

The Earth ſtruck againſt the Edifices with ſuch violent Percuſſions, that every Shock beat down the greater Part of them; and theſe taring with them vaſt Weights in their Fall, (eſpecially the Churches and high Houſes) compleated the Deſtruction of every Thing they encounter'd with, even of what the *Earthquake* had ſpared. The Shocks, although inſtantaneous, were yet ſucceſſive; and at Intervals Men were tranſported from one Place to another, which was the Means of Safety to ſome, whilſt the utter Impoſſibility of moving, preſerv'd others; that thereby it might viſibly appear, that the Divine Juſtice ſought nothing more from them than their Repentance and Amendment; for it caus'd its Mercy to ſhine forth in ſo reſplendent a Degree, that to an extraordinary Providence alone can be aſcrib'd the Preſervation of ſo many Lives.

To

To elucidate this, it muſt be obſerv'd, that there are 3000 Houſes, which make up the 150 Iſlands, or Squares of Buildings (which are made by the Streets croſſing each other in ſtreight Lines) contain'd within the Walls of the City. Theſe with the others near adjoining, and the Shops where Tradeſmen and poor People dwell; together with thoſe in the Suburbs or Borough of *Lazarus*, on the other Side of the River, (to which there is a Paſſage by the great Bridge) amounting in the whole to a Number ſufficient to contain 60,000 Perſons, for ſo many there are computed to be conſtantly reſident in this City. Now, although ſcarce twenty Houſes were left ſtanding, yet, by the moſt exact and diligent Search that could be made, it does not appear, from the Liſts taken of the Dead, that the Numbers of them had amounted to much more than 1141 Perſons.

Lima had arriv'd to as great a Degree of Perfection, as a City ſituated at ſuch a Diſtance from *Europe*, and diſcourag'd by the continual Dread of ſuch Calamities, was capable of. For, altho' the Houſes were but of moderate Height, being confin'd to one Story only, yet the Streets were laid out with the exacteſt Regularity, and adorn'd with all that Beauty which a true Symmetry could give: So that they were equally agreeable to the Sight, as commodious to the Inhabitants; *and diſplay'd* as much Elegance as if all the

Ornaments

Ornaments of the beſt Architecture had been beſtow'd upon them. To this may be added the delightful Appearance of many handſome Fountains, for whoſe Supply the Water was convey'd through ſubterraneous Aqueducts; and the towering Height of the Churches, and Structure of the religious Convents and Monaſteries. It may be affirm'd, that the Magnificence of theſe Edifices, if it did not exceed, at leaſt might rival the grandeſt Fabricks, of this Kind, in the whole World, for the Beauty of their Deſign, their Profiles, their Cemeteries, the Largeneſs of their Naves, their Cloiſters and Stair-caſes, were ſuch, as they had no Cauſe to envy any for Size or Elegance.

There were ſeventy-four Churches, great and ſmall, beſide publick Chapels, and fourteen Monaſteries, as many more Hoſpitals and Infirmaries; in all which the Richneſs of the Materials might vie with the Perfection of the Work; whether we conſider the Paintings and Pictures, or the Ornaments of Lamps, and Veſſels of Silver; the exquiſite Works of Gold and Pearls, with the precious Stones in the Cuſtodiums of the Hoſt, ſo call'd, becauſe in them is kept the conſecrated Wafer of the Sacrament; alſo the Crowns and Jewels with which they adorn the Images of their Saints. The Moveables and inſide Furniture of the principal Houſes, in Pictures, *Prints, Eſcrutores*, Looking-glaſſes, Hang-

trate the inſcrutable Judgments of God, in thus permitting the Deſtruction of his Temples, the Affliction of his Spouſes, (ſo the Papiſts call the Nuns) and ſo vaſt an Eccleſiaſtical Patrimony to be loſt. But it is ſtill more difficult (conſidering all that Havock) to conſider how ſo many Lives came to be preſerv'd; eſpecially when in the little Monaſtery of *Carmen*, or *Carmel*, out of twenty-one Nuns, whereof that Houſe conſiſted, twelve periſhed; which, indeed, was the largeſt Number of Nuns that ſuffered on this Occaſion, for in the other great Nunneries they did not amount to ſo many, although in ſome of them the Number of Maid-Servants who periſhed, were more. And in the Hoſpital of St. *Anne*, which was a Royal Foundation for the Relief of *Indians* of both Sexes, 70 of the Patients loſt their Lives, having been buried, at the Beginning of the *Earthquake*, by the Roofs of their grand Halls of their ſeveral Apartments, which fell upon them as they lay in their Beds, no Perſons being able to give them Aſſiſtance.

In ſhort, the Ruins of this City are ſuch, that the Place is render'd uninhabitable, as much from Inconveniency as Horror. The Streets, all choak'd up with the fallen Fragments of the Walls, ſcarce afford a Paſſage for Communication; and this is more ſenſibly perceiv'd in thoſe Parts where it was judg'd to be moſt neceſſary, which is at the

Foot

Foot of the Bridge; where the magnificent Arch, which ſtood at its Entrance, and was one very valuable Part of its moſt regular Architecture, is fallen down. It was but a few Years ago, that the Marquis of *Villa Garcia*, in order to add further to its Beauty, had caus'd to be erected upon it a moſt elegant and grand Statue of *Philip* the Vth, on Horſe-back, in a military Habit, which appear'd in exquiſite Proportion at that Height.

In fine, one cannot ſtir a Step without encountring ſome freſh Motive for the moſt melting Compaſſion. The Palace of the Viceroy, in which were contained the Courts of Judicature of the *Royal Audiencia*, or Court of Judges, the Tribunal of Accounts, the Treaſury, and all other Offices for Affairs of the Government, are render'd incapable of being inhabited, as every one of the Outbuildings of ſubſiſting any longer. The Tribunal of the holy Office of Inquiſition is become utterly unable to proceed in the Courſe of Buſineſs; the ſeveral Apartments of the Houſe being totally overthrown, as well as that magnificent and beautiful publick Chapel which belong'd to it. The Royal Univerſity, the Colleges, and the other Edifices of any Conſideration, now only ſerve, with the menacing Ruins that are left of them, to revive the melancholy Remembrance of what they were.

The

The Deſtruction of Callao *by the* EARTHQUAKE, *and the Irruption of the Sea.*

GREAT, indeed, was the Deſtruction of *Lima*; yet ſtill ſome Remains were left, ſome Traces of its former Magnificence. Not ſo it fares with *Callao*, its Port and Garriſon, where the very Objects of the Misfortune are vaniſh'd quite out of Sight; not the leaſt Sign of its former Figure is now to be ſeen: On the contrary, vaſt Heaps of Sand and Gravel occupying the Spot of its former Situation, it is, at preſent, become a ſpacious Strand extending along that Coaſt. Some few Towers, indeed, and the Strength of its Walls, endur'd a-while the whole Force of the *Earthquake*, and reſiſted the Violence of its Shocks; but ſcarcely had its poor Inhabitants begun to recover from their firſt Fright, which the dreadful Ruin and Devaſtation had occaſion'd there, (and how great that was, is not to be known) when ſuddenly the Sea began to ſwell, and ſwelling roſe to ſuch a prodigious Degree, that in falling from the Height it had attain'd (altho' *Callao* ſtood above it on an Eminence, which however imperceiva*ble, yet continues* ſtill increaſing all the Way

to

to *Lima)* it ruſh'd furiouſly forward, and overflow'd its antient Bounds with ſo vaſt a Deluge, that foundering the greater Part of the Ships which were at Anchor in the Port, and elevating the reſt above the Height of the Walls and Towers, drove them, and left them on dry Ground far beyond the Town; at the ſame Time it tore up, from the Foundation, every Thing that was in it of Houſes and Buildings, excepting only the two grand Gates, and here and there ſome ſmall Fragments of the Walls themſelves; which, as Regiſters of the Calamity, are ſtill to be ſeen among the Ruins and the Waters, a dreadful Monument of what they were.

In this raging Flood were drowned all the Inhabitants of the Place, who, at that Time, might amount to 5000 Perſons of all Ages, Sexes, and Conditions, according to the moſt exact Calculation that can be made. Such of them as could lay hold of any Pieces of Timber, which the general Wreck afforded, floated about for a conſiderable Time, and kept themſelves above the Waves: But thoſe Fragments, which offer'd them Aſſiſtance in their Diſtreſs, proved, by their Multitude, the greateſt Occaſion of their Deſtruction; becauſe, wanting Room to move in, they were continually ſtriking againſt each other, thro' the Agitation of the Water; and thus beat off thoſe who had clung to them.

By ſome of thoſe who were ſo happy as to ſave themſelves, amounting at moſt to 200, we have been inform'd, that the Waves, in their Retreat, encountring one another, by Means of the Obſtacles which the Water met with at its Reflux, ſurrounded thus the whole Town, without leaving any Means for Preſervation; and that, in the Intervals, when the Violence of the Inundation was a little abated, by the retiring of the Sea, there were heard the moſt lamentable Outcries of the wretched Inhabitants in their Diſtreſs.

Witneſſes likewiſe of this Account, and the Shrieks that were heard, are thoſe who, being on Board the Ships at the Time when, by the great Elevation of the Sea, they were carried over the Town, had the Opportunity of eſcaping unhurt. It will not be difficult to conceive the diſmal Confuſion and Streights which thoſe miſerable People found themſelves in, when we conſider, that they only preſerv'd their Lives from each preſent impetuous Attack of the Sea, in order to prolong the dreadful Affliction, which the Apprehenſion of inevitably loſing them at the Return of the next overwhelming Wave, muſt infallibly have occaſion'd.

There were twenty-three Ships, great and ſmall, at Anchor in the Port at the Time of the *Earthquake*, and of theſe ſome were ſtranded, being four in Number, *viz.* the *St. Firmin Man of War*, which was found in the low Grounds

Grounds of the *Upper Chacara*, the Part oppoſite to the Place where ſhe rode at Anchor; and near her the *Sant Antonio*, a new Merchant-Ship, juſt arriv'd from *Guiaquil*, where ſhe was built; the Veſſel of *Don Adrian Corzi* reſted on the Spot where before ſtood the Hoſpital of *St. John of God*; and the Ship *Succour*, juſt arriv'd the ſame Evening from *Chili*, was thrown up towards the *Cordon* Mountains, both one and the other of them at great Diſtances from the Sea; and all the reſt were founder'd.

The great Vaults, where the Commodities brought from other Parts (which ſupplied *Lima*, and made up a great Part of its Commerce) uſed to be depoſited; ſuch as Corn, Tallow, Jars of Wine, and Brandies, Cables, Iron, Timber, Tin, Copper, and the like Effects, and were at this Time well fill'd with them. The Wealth of the Town itſelf was likewiſe very conſiderable; and no ſmall Quantity of Money was then circulating there. To theſe if we add the Moveables, the Ornaments of the Churches, which abounded in Curioſities of Gold and Silver; laſtly, the Apparatus of Proviſions and Munitions of War belonging to his Majeſty, which were kept in the Royal Store-houſes and Magazines: All theſe Articles put together, ſwell greatly the Amount of the actual Loſs, without reckoning the Demolition of the Buildings, and the Value of the Quit-Rents.

In that diſmal Night, whilſt all the Inhabitants of *Callao* periſh'd, thoſe of *Lima* were diſtracted with the Apprehenſion of their own Danger, and the Horror of their Minds, occaſion'd by the frequent Repetitions of the *Earthquake*, which continued, without Intermiſſion, the whole Night; and by this Means it happens, that the exact Time of its Duration is not determinable. But this Horror was greatly encreaſed by the News of the dreadful Tragedy then acting at *Callao*, which far exceeded all the great *Earthquakes* that had before happen'd there: For altho' they were ſometimes the Occaſion of Floods in that Garriſon, yet thoſe Floods did no real Damage to the Town, or the Inhabitants, farther than putting them in a Fright. The Truth of this diſmal Story was confirm'd next Morning by the Soldiers, who, by Order of the Viceroy, had been there for Information.

By this Time alſo many were continually arriving, of ſuch as were ſent thither to make Enquiry how Things ſtood, on the Part of thoſe who had Dealings with the People of that Place, or were concerned in the Trade and Cargoes of Ships. As theſe Perſons were not preſent themſelves at this Scene of Woe and Deſtruction, they only brought an Account of what they could collect from thoſe who had ſav'd their Lives; and, except ſome very few, were all Fiſhermen and Sailors.

Theſe,

Theſe, after having been driven about ſeveral Times as far the Iſland of St. *Laurence*, more than two Leagues diſtant from the Port, found Means to ſave themſelves upon Planks; ſome of them were accidentally caſt upon the Sea-ſhore, others upon that Iſland, and thus were preſerv'd. But the exceſſive Greatneſs of the Calamity which had befallen *Callao*, helped, in ſome Meaſure, to mitigate the Grief occaſion'd by the deplorable Circumſtances to which they were reduced themſelves. Every one return'd Thanks to God, for the great Mercy ſhewn to him in his own particular Preſervation.

Broad Day at length appear'd, and the Light, which was never long'd for with greater Anxiety, inſtead of adminiſtring Conſolation, increas'd the Affliction, and brought a deeper Gloom on the People; and, at one View, diſtinctly diſcover'd all that mighty Ruin, which the Confuſion of their Fright did not permit them to frame any juſt Idea of; and this Calamity would probably have put a final End to every Thing, (their Deſpair ſinking them more, if poſſible, than the Shocks of the *Earthquake* had done their City) had not Heaven inſpir'd the Viceroy with Reſolution, Vigilance, and Activity for the publick Service on this momentous Occaſion. He appear'd on Horſe-back in all the Streets, without any Apprehenſion of his own Danger, *from the impending* Fragments of Walls

that were yet ſtanding; and who, after having paſs'd the Night without any Regard to the Safety of his own Perſon, which he freely expos'd wherever he judg'd his Aſſiſtance neceſſary. Having taken a View of the Ruins, and conſider'd the Whole, he return'd to the great Square, with a Reſolution to dedicate himſelf to the laborious Taſk, of immediately diſpatching all the proviſionary Orders which the Nature of the Caſe requir'd.

As the firſt Thing to be dreaded was the Want of Corn, all that which was depoſited in the Vaults of *Callao* having been deſtroy'd, the Ovens for baking Bread in *Lima* likewiſe all demoliſh'd, and the Conduits thro' which the Water was convey'd to the Mills, all choak'd up, ſo that, by theſe Means, this neceſſary Relief was obſtructed; he immediately therefore order'd three Soldiers of his Guards to the Governors of the adjacent Diſtricts, with Orders to remit all the Corn which ſhould be found in their reſpective Governments. He gave Orders, at the ſame Time, for aſſembling the Bakers of the City together, to know of them what Aſſiſtance th y wanted, to enable them to repair their Ovens, and carry on their Trade. To which Purpoſe he commanded the Water-bailiff and Super-intendant of the Pipes, to examine and repair all the Aqueducts, Conduits of the Mills, and Fountains of the City, that the *Courſe of the* Water might not be obſtructed;

he likewiſe cauſed it to be notified to the Perſons whoſe Buſineſs it is to provide Fleſh-meat, (for they have no Butchers, but the landed Gentlemen take their Turns to ſerve the City with live Cattle for the Slaughter) that they ſhould continue to kill Animals as they did before.

His Excellency likewiſe granted to the Farmer of the Reſervoirs of Ice as many Horſe-Soldiers as he requir'd, to enable him to procure ſufficient Hands to clear the Roads, by which that great Refreſhment is brought to the City, and which had been render'd quite impaſſable by the *Earthquake*. In Conſequence of which good Reſolutions, the City was well ſupplied with Proviſions.

Nor was his Attention leſs to the Relief of the impreſs'd Men, who were in the Iſland of *Callao*, condemn'd to the digging of Stone in thoſe Quarries, for the Works of the Garriſon; and therefore order'd a Number of ſmall Barks to be got ready to tranſport them over to the Continent, and to put them in a Place of Safety; all which was effectually executed. By this Means alſo were brought back many of thoſe who had ſav'd themſelves in this Iſland from the Diſaſter of *Callao*; and by this Aſſiſtance had an Opportunity of curing Bruiſes and Hurts receiv'd from the repeated Strokes of the Waves, and the Blows of the ruined Pieces of Wreck.

Having

Having thus provided for the Relief of the Living, his next Care was to beſtow Burial on the Bodies of thoſe who loſt their Lives among the Ruins of the City. For this Purpoſe he caus'd the Fraternity of the Order of Charity to be ſummon'd together, and gave Directions, that, with the Aſſiſtance of the City Aldermen, they ſhould collect and convey the Corps which ſhould be found, to the ſeveral Churches and Convents, with whoſe Principals he had already concerted their Reception.

The Viceroy likewiſe uſed his utmoſt Endeavours to prevent the Loſs of the Royal Property. For this Purpoſe he order'd the Captain of the Arſenal of Arms of his Palace, immediately to cauſe the Ruins thereof to be clear'd away; and taking out the military Weapons, to convey them to ſome other Place of Security. He likewiſe caus'd a Survey to be made of the Ships that were ſav'd, and of the Condition they were in; purſuant to which he was ſoon inform'd, that the Corn and Tallow on board the *Succour* was ſav'd, which would afford ſome Supply to the City; and that the St. *Firmin* Man of War was in ſuch a Situation, that ſhe muſt be took to Pieces, it being impracticable, otherways, to make any Thing of her. He likewiſe iſſued a Proclamation, directing the Superintendant of *Callao*, the Royal Officers in waiting at *that Garriſon*, the Lieutenant-General of the Artillery,

Artillery, and the Captain of the Arſenal of Arms, to take a Survey of all ſuch Stores and Effects belonging to their reſpective Branches of Buſineſs as had been ſav'd, and that they ſhould uſe proper Means to collect and ſecure the ſame as Part of the Royal Property, in Conjunction with the Town-Major of the Garriſon, who was to attend upon them with Soldiers and Labourers hired for that Purpoſe.

A Guard was likewiſe placed on the Royal Mint, which was entirely in Ruins; and where, at that Time, there were very large Quantities of Gold and Silver belonging to the King, and other particular Perſons. This Wealth lying ſo much expos'd, was liable to be ſtolen, as the Place was at a conſiderable Diſtance from the Royal Treaſury, which being near the Viceroy's Houſe, was in leſs Danger.

They ſent Word from *Callao*, and the Villages along its Coaſts, that the dead Bodies of ſuch as had been drowned by the Inundation, were continually driving to Land; and that the Sea had thrown up a great Quantity of the Goods, and other valuable Effects, which had been ſet adrift by the ſeveral Wrecks and Inundation of the City. They gave Notice alſo, that the Shores were throng'd with a great Concourſe of People, whom the Deſire of Plunder had brought together. Upon which his Excellency gave Orders to the Corregidor to go with a great Number of Soldiers,

Soldiers, and others, to the Villages of *Miſaflores* and *Chorrillos* in the Juriſdiction of his Commad; there to cauſe all ſuch dead Bodies as he ſhould meet with along the Coaſt, to be interr'd; and to ſecure all the Goods which the Sea was continually caſting up. The ſame Orders were given to the Town-Major of *Callao*; and alſo to the Tribunal of the Conſulate of Merchants, directing them immediately to take the propereſt Meaſures to prevent the Embezzlement of ſuch Effects, and to collect together all that could be found, in order to reſtore the ſame to the Perſons who ſhould afterwards appear to be the Proprietors, according to the Rules of Juſtice, and Laws of Commerce. And that none might preſume to ſteal or plunder any of the Effects which were ſo collected together, a Proclamation was iſſued, making it Death for any Body to purloin the leaſt Trifle belonging to them; and to enforce this Edict, two Gibbets were immediately erected at *Lima*, and two others on the Strand of of *Callao*; that by the Sight of theſe Engines of Puniſhment, all evil-minded Perſons might be deterr'd from ſecreting, and not diſcovering ſuch Goods as they had pick'd up.

Farther, the Viceroy augmented the Number of Soldiers in the two Companies of Horſe and Foot Guards, and paid them in Proportion; and appointed three ſeveral *Corps* of theſe Soldiers, continually to patrole about

about the City, in order to prevent Murders, Robberies, and other Miſchiefs, which the deſolate Condition of the Houſes might facilitate, and which the neceſſitous Circumſtances of many might excite, eſpecially among the incorrigible Mob and common People, on whom the moſt diſmal Spectacle, which they had of this Diſaſter before their Eyes, could not make any Impreſſion; and therefore it was fit that their Inſolence ſhould be reſtrained by the Fear of incurring a rigorous Puniſhment.

By theſe provident and well-regulated Diſpoſitions, his Excellency very much mitigated the Calamity, which, in Caſes of this Nature, is uſually rather increas'd by the Confuſion than the Evil itſelf. And, indeed, nothing leſs than an exact Obedience to his Orders, could have preſerv'd the Authority and Reſpect due to him, when engag'd in quelling that impetuous Tumult, wherewith the City was diſtracted by the falſe Rumour which at one and the ſame Time was ſpread thro' every Part of it; namely, that the Sea was riſing and advancing ſwiftly towards it: Inſomuch that the People ran in confus'd Multitudes towards the Mountains, there to ſeek a Place of Safety.

The Hurry with which every one puſh'd forward was ſo irreſiſtible, that even thoſe, who, from the Circumſtances of the Report *which render'd* it incredible, and the Know-

ledge of much ſuch another Accident, which happen'd in the Year 1686, did not believe it, ſuffer'd themſelves, however, to be carried on, or rather were impelled by the general Torrent. The People were almoſt dead with the Fright and Fatigue; and ſome of them actually died, notwithſtanding the Day-light, which yet remained, might have convinced them of their Error; but the firſt Report ſtill prevailing, confirm'd them in a Reſolution ſtill to proceed.

In Truth, the Conſternation their Minds were in on Account of the Diſaſter at *Callao*, made their Fright thus get the better of their Reaſon; and ſo perplexed their Thoughts, that they could not call to Mind how high the City ſtands in Reſpect to the Sea; for in the great Square the Ground is elevated near 170 Yards above the Surface of the Ocean, and ſtill continues riſing in the Parts that lie towards the Eaſt; and therefore that it was impoſſible ſuch a Thing could happen in a Place where the Land lay ſo high above the Sea.

His Excellency conſidering the dangerous Conſequences that might attend this unlucky Incident, mounted his Horſe, reſolving to follow after, and penetrate into the Midſt of the confuſed Multitude; and no ſooner was his Preſence ſeen among them, but the Uproar was quell'd, and the tumultuous Cries *and Shrieks* of the People were huſh'd in a Moment;

Moment; and what neither the ſtrict Relation of conjugal Love, the natural Tenderneſs for their Children, nor the Thoughts of abandoning their Eſtates, could effect, the Word of Command of one ſingle Man immediately brought about. Every one halted on the Spot; and beginning to perceive the whole Deluſion, which they were incapable of obſerving before thro' their Fright, it was the moſt moving Spectacle that could be. In their Retreat back again, the Separation of Perſons nearly related, and the Moanings of Mothers for their Children, occaſioned another Scene of freſh Confuſion, which render'd them inſenſible of their Fatigue and Wearineſs. Thus he deliver'd the People out of a Danger which might have prov'd almoſt as fatal as that of an Inundation.

His next Care was, to provide for the Relief of the Monaſteries; for which Purpoſe he gave Orders that they ſhould be ſupplied on their ſeveral Credits with Bread and Fleſh-meat; and that the Aldermen of the City ſhould divide among themſelves the Care of all thoſe Fraternities; and to demoliſh ſuch Parts of their Convents as threaten'd Ruin, and to protect them from all ſuch Inſults as they might be ſubject to from Thieves, *&c.*

His Attention was next turn'd to the rebuilding of the City. With this Intent he appointed *Don Lewis Godin*, of the Royal *Academy of Sciences* at *Paris*, and Profeſſor of the

the Mathematicks in the Univerſity of *Lima*, to project a Plan and Deſign of the Proportions, Form, and Rule to be obſerv'd in the building of the Houſes, and other Edifices of the City, in ſuch a Manner as that the Inhabitants might not, for the future, be in Danger from ſuch violent *Earthquakes*, which ought always to be dreaded; or, at leaſt, that the Damage and Havock, occaſion'd by thoſe Convulſions of Nature, might not be ſo great as what they had lately experienced.

In the next Place he applied himſelf to the reſtoring *Callao* as ſoon as poſſible. He went thither in Perſon, carrying with him the aforeſaid *Don Lewis Godin*, to ſurvey all that Ground, and to find out a Situation whereon to erect a competent Fortification, which might ſerve for a Defence of the Marine againſt the Invaſion of Pirates, or any other Enemy; likewiſe to chuſe a Place where beſt they might make Vaults, and build Warehouſes for depoſiting Effects which might be imported from Abroad, that ſo there might be no Stagnation in Trade. Having given Directions in ſo neceſſary a Buſineſs, he return'd to the City, to concert the proper Meaſures for putting what he had reſolv'd upon in immediate Execution.

The

The Extent of the EARTHQUAKE; *with the* Warnings *and* Prophecy *concerning it.*

THE Shocks which were felt that fatal Night, every Quarter of an Hour, or oftener, were repeated three or four Times, at leaſt, every Day during the ſucceeding whole Month of *November*; ſome of them attended only with Noiſes, but others with exceſſive Tremblings; a Sign that there ſtill remain'd Plenty of Matter proceeding from Minerals collected in the Subterranean Cavities that are in the Neighbourhood of *Lima*, and Port of *Callao*, where the greateſt Havock was made. For it appears from the Accounts which the Poſts brought from the Coaſts lying North and South of that Place, that the farther the Parts were remov'd from this Center, the leſs the *Earthquake* was perceiv'd; and that not one ſingle Perſon had been loſt, either in the Towns near the Sea, or within Land, except in *Guancavilica*, where exceſſive Shocks were felt, and Noiſes heard.

In Effect, the Ruin of Buildings extended on one Side no farther than to *Canete*, a maritime Town about 80 Miles South-Eaſt *of Callao*; and on the other to Chancay, a maritim

maritime Town North-Weſt of *Callao*, and *Guara*, a Port about 24 Leagues North North-Weſt of the ſame; at which laſt Place the vaſt ſtrong Bridge that was built over the River fell to Pieces. But as this was the neceſſary Paſſage from all the Valleys below, the Viceroy immediately diſpatched an Order to the Corregidor of that Juriſdiction inſtantly to proceed to the rebuilding of it. Nor was there any Account of any Damage done by the Irruption of the Sea to any of the Towns through the utmoſt Extent of either Coaſt; excepting only the unfortunate Wreck of the Ship *Conception*, which in its Paſſage from *Manama*, being at Anchor in the Port of *Tanta*, was ſo ſuddenly ſurprized, that ſhe was foundered before ſhe had any Time to help herſelf. But the *Soledad* had better Fortune on the Coaſt more beyond in the Port of *Maſia*; for the Captain perceiving the Retreat the Sea was making from the Shoar, had Time to take the Precautions neceſſary to preſerve her from receiving any Damage.

The *Spaniſh* Author of this Relation here makes ſome moral Reflections on the dreadful Marks of Divine Power ſo eminently viſible in this terrible Deſtruction; and then adds, that in proportion to the Evil God has been graciouſly pleaſed to provide us Remedies; and if our own Hardneſs of Heart had *not with-held* his Grace from us, we might perhaps

perhaps have avoided the Misfortune by our Amendment of Life, and an humble Recourſe to his Mercies; For the Deity afforded us all proper Admonitions for that Purpoſe, and which in the natural Way, by Means of various fiery Exhalations, which in ſeveral preceding Nights were obſerved towards *Callao*, and viſible from the Iſland near it; and then again by other Methods, in which the Merit of our Puniſhment is more eaſily diſcernible.

What I mean is, a Prediction of all this lamentable Cataſtrophe, (which remained in the Hands of a very few Perſons; and that too without being the leaſt regarded) utter'd, many Months before it happen'd, by our Mother *Tereſa* of *Jeſus*, a Nun in the Monaſtery of *Barefoots* of *St. Joſeph* in this City; with repeated and moſt efficacious Aſſeverations of what was to come to paſs; to which ſhe added, that her Life would not laſt long enough for her to experience the ſad Event; and in Fact ſhe died at the Age of above a Hundred Years, the 15th of the ſame Month of *October*, a Year before the Earthquake happened. To demonſtrate the Truth of this, Informations are now actually making, which will contain the whole Particulars of the Caſe; altho' at that Time the extreme Earneſtneſs with which ſhe delivered her Predictions, was look'd upon as a Mark of the *Failure of her* Underſtanding at that advanced

ced Age: For it was the Divine Will that the very Lights by which human Wiſdom (ever circumſpect in Caſes of the like Nature) was uſed to govern itſelf, ſhould be obſcur'd through want of ſuch Notice †, in order thus to carry the Blow into Execution; which Proceeding we ought to believe is convenient for us, without ſearching farther into the hidden Judgments of its high Deſign.

An Account of a dreadful EARTHQUAKE, *that happened at* Port-Royal *in* Jamaica, *on* June *the 7th*, 1692; *in two Letters written by the Miniſter of that Place.*

The firſt Letter dated June 22, 1692.

Dear Friend,

I Doubt not but you will, both from Gazettes and Letters, hear of the great Calamity that has befallen this Iſland by a terrible

† Rather through a Diſregard of ſuch Notice; for if there was ſuch a Prophecy, as is petended, Notice was *given*. But it looks very ſuſpicious, that God ſhould reveal a *Warning* of his Judgments to no Effect. Were the Natives

ble *Earthquake*, on the 7th Inſtant, which hath thrown down almoſt all the Houſes, Churches, Sugar-works, Mills, and Bridges, through the whole Country. It tore the Rocks and Mountains, deſtroy'd ſome whole Plantations, and threw them into the Sea. But *Port-Royal* had much the greateſt Share in this terrible Judgment of God. I will therefore be more particular in giving you an Account of its Proceedings in this Place, that you may know what my Danger was, and how unexpected my Preſervation.

On *Wedneſday* the 7th of *June* I had been at Church reading Prayers, which I did every Day ſince I was Rector of *Port-Royal*, to keep ſome Shew of Religion among a moſt ungodly debauched People; and was gone to a Place hard by the Church, where the Merchants uſed to meet, and where the Preſident of the Council was, who acts now in Chief till we have a new Governor. This Gentleman came into my Company, and engaged me to take a Glaſs of Wormwood-wine with him, as a Whet before Dinner.

He being my very great Friend, I ſtaid with him. Hereupon he lighted a Pipe of

Natives of *Lima* more unbelieving, or leſs in the Divine Favour, than the Inhabitants of *Nineveh*, who repented on the propheſying of *Jonas* againſt that City? Or, were they ſo ripe for Vengeance, that the Deity harden'd their Hearts, like that of *Pharaoh*, ſo that they ſhould not regard the Warning, which he had ſent them, of their Deſtruction, by an Evil which they were always in Fear of?

Tobacco, which he was pretty long a taking; and not being willing to leave him before it was out, this detained me from going to Dinner to one Capt. *Ruden*'s, where I was to dine; whoſe Houſe, upon the firſt Convulſion, ſunk into the Earth, and then into the Sea, with his Wife and Family, and ſome who were come to dine with him. Had I been there, I had been loſt. But, to return to the Preſident, and his Pipe of Tobacco. Before that was out, I found the Ground rolling and moving under my Feet; upon which I ſaid, *Lord, Sir, what's that?* He replied very compoſedly, being a very grave Man, *It is an Earthquake; be not afraid, it will ſoon be over:* But it increaſed, and we heard the Church-Tower fall; upon which we ran to ſave ourſelves; I quickly loſt him, and made towards *Morgan*'s Fort, which being a wide open Place, I thought to be there ſecureſt from the falling Houſes: But as I made towards it, I ſaw the Earth open, and ſwallow up a Multitude of People, and the Sea mounting in upon us over the Fortifications.

I then laid aſide all Thoughts of eſcaping, and reſolv'd to make towards my own Lodging, there to meet Death in as good a Poſture as I could. From the Place where I was, I was forced to croſs, and run through two or three narrow Streets. The Houſes and Walls fell on each Side of me. Some Bricks came *rolling over* my Shoes, but none hurt me.

When I came to my Lodging, I found there all Things in the ſame Order I left them; not a Picture, of which there were ſeveral fair ones in my Chamber, being out of its Place. I went to my Balcony to view the Street in which our Houſe ſtood, and ſaw never a Houſe down there, nor the Ground ſo much as crack'd. The People ſeeing me, cried out to me to come and pray with them. When I came into the Street, every one laid hold of my Cloaths, and embraced me, that with their Fear and Kindneſs I was almoſt ſtifled. I at laſt perſuaded them to kneel down, and make a large Ring, which they did. I pray'd with them near an Hour, when I was almoſt ſpent with the Heat of the Sun, and the Ex-exerciſe. They then brought me a Chair; the Earth working all the while with new Motions and Tremblings, like the Rollings of the Sea; inſomuch that ſometimes, when I was at Prayer, I could hardly keep myſelf upon my Knees.

By that Time I had been half an Hour longer with them, in ſetting before them their Sins and heinous Provocations, and ſeriouſly exhorting them to Repentance, there came ſome Merchants of the Place, who deſir'd me to go on board ſome Ship in the Harbour, and refreſh myſelf, telling me that they had a Boat to carry me off. I found the Sea had entirely ſwallow'd up the Wharf, with all the goodly Brick Houſes upon it,

moſt of them as fine as thoſe in *Cheapſide*, and two entire Streets beyond that. From the Tops of ſome Houſes which lay levelled with the Surface of the Water, I got firſt into a Canoe, and then into a Long-boat, which put me a-board a Ship called the *Siam-Merchant*. There I found the Preſident ſafe, who was overjoy'd to ſee me, and continued there that Night, but could not ſleep for the Returns of the *Earthquake*, almoſt every Hour, which made all the Guns in the Ship to jar and rattle.

The next Day I went from Ship to Ship to viſit thoſe that were bruiſed and dying; likewiſe to do the laſt Office at the ſinking of ſeveral Corps which came floating from the Point. This, indeed, hath been my ſorrowful Employment ever ſince I came aboard this Ship with Deſign to come for *England*; we having had nothing but Shakings of the Earth, with Thunder and Lightning, and foul Weather ever ſince. Beſides, the People being ſo deſperately wicked, it makes me afraid to ſtay in the Place; for that very Day this terrible *Earthquake* happen'd, as ſoon as Night came on, a Company of lewd Rogues, whom they call Privateers, fell to breaking open Warehouſes, and Houſes deſerted, to rob and rifle their Neighbours, whilſt the Earth trembled under them, and the Houſes fell on ſome of them in the Act; and thoſe audacious

Whores who live ſtill upon the Place, are as impudent and drunken as ever.

I have been twice on Shoar to pray with the bruiſed and dying People, and to chriſten Children, where I found too many drunk and ſwearing. I did not ſpare them, nor the Magiſtrates neither, who have ſuffer'd Wickedneſs to grow to ſo great a Height. I have, I bleſs God, to the beſt of my Skill and Power, diſcharged my Duty in this Place, which you will hear from moſt Perſons, who come from hence, I have preached ſo ſeaſonably to them, and ſo plain. In the laſt Sermon I deliver'd in the Church, I ſet before them, what would be the Iſſue of their Impenitence and Wickedneſs, ſo clearly, that they have ſince acknowledged, it was more like a Prophecy than a Sermon. I had, I confeſs, an Impulſe upon me to do it; and many Times I have preached in this Pulpit, Things which I never premeditated at Home, and could not, methought, do otherwiſe.

The Day when all this befel us, was very clear, and afforded not the Suſpicion of the leaſt Evil; but in the Space of three Minutes, about half an Hour after Eleven in the Morning, *Port-Royal*, the faireſt Town of all the *Engliſh* Plantations, the beſt Emporium and Mart of this Part of the World, exceeding in its Riches, plentiful of all good Things, was ſhaken and ſhatter'd to Pieces, ſunk into, and *cover'd, for the* greater Part, by the Sea, and will,

will, in a ſhort Time, be wholly eaten up by it; for few of thoſe Houſes which yet ſtand, are left whole, and every Day we hear them fall, and the Sea daily encroaches upon it. We gueſs, that, by the falling of the Houſes, opening of the Earth, and Inundation of the Waters, there are loſt about 1500 Perſons, and many of good Note; of whom my good Friend, Attorney-General *Muſgrove*, is one, my Lord Secretary *Reves* is another. *William Turner*, *Thomas Turner*'s Brother, is loſt. Mr. *Swymer* eſcap'd, but his Houſe-mate, Mr. *Watts*, periſh'd.

I came, as I told you, on board this Ship, in order to return Home; but the People are ſo importunate with me to ſtay, that I know not what to ſay to them. I muſt undergo great Hardſhips if I continue here, the Country being broke all to pieces, and diſ-ſettled. I muſt live now in a Hut, eat Yams and Plantans for Bread, which I could never endure; drink Rum-punch and Water, which were never pleaſing to me. I have written to ſend a younger Perſon, who may better endure the Fatigue of it than I can: But if I ſhould leave them now, it would look very unnatural to do it in their Diſtreſs; and therefore, whatever I ſuffer, I would not have ſuch a Blame lie at my Door, ſo that I am reſolved to continue with them a Year longer. They are going, in all Haſte, to build *a new Town*, near the Rock *Linnavea*, the Guardian

Guardian of this Iſland. The *French*, from *Pituguaveis*, or *Petitgoavias*, in *Hiſpaniola*, did attack this Iſland on the North Side; but were all defeated and deſtroy'd, it being about the Time of the *Earthquake*.

The ſecond Letter, dated June 28. 1692.

EVER ſince that fatal Day, the moſt terrible that ever I ſaw in my Life, I have liv'd on board a Ship; for the Shakings of the Earth return every now and then. Yeſterday we had a very great one, but it ſeems leſs terrible on Ship-board than on Shore; yet I have ventur'd to *Port-Royal* no leſs than three Times ſince its Deſolation, among the ſhatter'd Houſes, to bury the Dead, pray with the Sick, and chriſten the Children. *Sunday* laſt I preach'd among them in a Tent, the Houſes which remain being ſo ſhatter'd, that I durſt not venture in them. The People were overjoy'd to ſee me among them, and wept bitterly when I preach'd. I hope, by this terrible Judgment, God will make them reform their Lives, *for there was not a more ungodly People on the Face of the Earth.*

It is a ſad Sight, to ſee all this Harbour, one of the faireſt and goodlieſt I ever ſaw, cover'd with the dead Bodies of People of all Conditions,

Conditions, floating up and down without Burial; for our great and famous Burial-place, call'd the *Paliſadoes*, was deſtroy'd by the *Earthquake*; which daſhing to Pieces the Tombs, whereof there were Hundreds in that Place, the Sea waſhed the Carcaſſes of thoſe, who had been buried, out of their Graves. Multitudes of rich Men are utterly ruin'd, whilſt many, who were poor, by watching Opportunities, and ſearching the wrecked and ſunk Houſes, (even almoſt while the *Earthquake* laſted, and Terror was upon all the conſiderable People) have gotten great Riches.

We have had Accounts from ſeveral Parts of the Iſland, of the Miſchiefs done by the Earthquake. From *St. Anne*'s we hear of 1000 Acres of Wood-land changed into the Sea, and carrying with it whole Plantations. But no Place ſuffered like *Port-Royal*; where whole Streets (with Inhabitants) were ſwallowed up by the opening Earth, which then ſhutting upon them, ſqueezed the People to Death. And in that Manner ſeveral are buried with their Heads above Ground; only ſome Heads the Dogs have eaten; others are covered with Duſt and Earth, by the People who yet remain in the Place, to avoid the Stench.

Thus have I told you a long and a ſad Story, and God knows what worſe may happen *yet*. The People tell me, that they hear great

great Bellowings and Noiſes in the Mountains; which makes ſome very apprehenſive of an Eruption of Fire; if ſo, it will, I fear, be more deſtructive than the Earthquake. I am afraid to ſtay, and yet I know not how, in Point of Conſcience, at ſuch a Juncture as this, to quit my Station.

Several Accounts of this deſolating Earthquake were likewiſe tranſmitted to the Royal Society at *London*, from ſeveral Perſons then reſiding at *Jamaica*; the Particulars of which are as follow: The Earth opening, ſwallowed up People, and they roſe in other Streets; ſome in the Middle of the Harbour, and yet were ſaved; tho' there were 2000 People loſt, and 1000 Acres of Land ſunk. All the Houſes were thrown down throughout the Iſland. One *Hopkins* had his Plantation remov'd half a Mile from the Place. Of all Wells, from one Fathom to ſix or ſeven, the Water flew out at the Top with a vehement Motion. While the Houſes, on one Side of the Street, were ſwallow'd up, on the other they were thrown in Heaps; and the Sand in the Street roſe like Waves in the Sea, lifting up every Body that ſtood on it, and immediately dropping down into Pits; and at the ſame Inſtant a Flood of Water breaking in, rolled them over and over; ſome catching hold of Beams, Rafters, *&c.* Ships and Sloops in the Harbour were overſet and loſt; the *Swan Frigate* particularly, by the Motion of the

the Sea, and ſinking of the Wharf, was driven over the Tops of many Houſes. It was attended with a hollow rumbling Noiſe, like that of Thunder. In leſs than a Minute three Quarters of the Houſes, and the Ground they ſtood on, with the Inhabitants, were all ſunk quite under Water; and the little Part left behind, was no better than Rubbiſh. The Shock was ſo violent, that it threw People down on their Knees, or their Faces, as they were running about for Shelter. The Ground heav'd and ſwell'd like the rolling Sea; and ſeveral Houſes, ſtill ſtanding, were ſhuffled and mov'd ſeveral Yards out of their Places. A whole Street is ſaid to be twice as broad now as it was before; and in many Places the Earth would crack, and open, and ſhut quick and faſt. Of which Openings two or three Hundred might be ſeen at a Time; in ſome whereof the People were ſwallow'd up; others, the cloſing Earth caught by the Middle, and preſſed to Death; in others, the Heads only appear'd. The larger Openings ſwallow'd up Houſes; and out of ſome would iſſue whole Rivers of Waters, ſpouted up a great Height into the Air, and threatening a Deluge to that Part the *Earthquake* ſpared. The Whole was attended with Stenches and offenſive Smells, the Noiſe of falling Mountains at a Diſtance, *&c.* and the Sky, in a Minute's Time, was turn'd dull and reddiſh, like *a glowing* Oven. Yet, as great a Sufferer as

Port-

Port-Royal was, more Houſes were left ſtanding therein, than on the whole Iſland beſide. Scarce a Planting-houſe, or Sugar-work, was left ſtanding in all *Jamaica*. A great Part of them were ſwallow'd up, Houſes, People, Trees, and all at one Gape; in Lieu of which afterwards appear'd great Pools of Water, which, when dried up, left nothing but Sand, without any Mark, that ever Tree, or Plant, had been thereon. Above 12 Miles from the Sea, the Earth gaped, and ſpouted out, with a prodigious Force, vaſt Quantities of Water into the Air; yet the greateſt Violences were among the Mountains and Rocks; and it is a general Opinion, that the nearer the Mountains, the greater the Shake; and that the Cauſe thereof lay there. Moſt of the Rivers were ſtopped up for 24 Hours, by the falling of the Mountains; till ſwelling up, they made themſelves new Tracks and Channels; taring up, in their Paſſage, Trees, *&c.* After the great Shake, thoſe People who eſcaped, got on board Ships in the Harbour, where many continued above two Months; the Shakes being all that Time ſo violent, and coming ſo thick, ſometimes two or three in an Hour, accompanied with frightful Noiſes, like a ruffling Wind, or a hollow rumbling Thunder, with Brimſtone Blaſts, that they durſt not come aſhore. The Conſequences of the *Earthquake* was a general Sickneſs, from the noi-

ſome Vapours belched forth, which ſwept away above 3000 Perſons.

As ſoon as the violent Shake was over, the Miniſter deſir'd all People to join with him in Prayer; and among them were ſeveral *Jews*, who kneel'd and anſwer'd as the reſt did; nay, the Author was told, that they were heard to call upon JESUS CHRIST; a Thing, ſays he, worth Obſervation!

The two great Mountains, at the Entrance of 16 Mile-walk, fell, and meeting, ſtopt the River; ſo that it was dry, from that Place to the Ferry, for a whole Day; and vaſt Quantities of Fiſh were taken up, greatly to the Relief of the diſtreſſed and terrified Inhabitants. At *Yellows*, a great Mountain ſplit, and falling into the level Land, cover'd ſeveral Settlements, and deſtroy'd 19 white People. Had the Shake happen'd in the Night, very few would have eſcaped.

But the Mortality which enſued the great *Earthquake* (for they had little ones daily) made greater Havock than the *Earthquake* itſelf. By an Account dated the 23d of *September* following, almoſt half the People, who eſcap'd at *Port-Royal*, were ſince dead of a malignant Fever, from Change of Air, want of dry Houſes, warm Lodging, proper Medicines, and other Conveniencies. Dr. *Morley* obſerves, that this Sickneſs (ſuppoſed to proceed from the hurtful Vapours belched from the many Openings of the Earth) ſpread

all

all over *Jamaica*, and became ſo general that few eſcaped it. 'Tis thought it ſwept away, in many Parts of the Iſland, 3000 Souls; moſt of them from *Kingſtown* only.

The ſame Gentleman takes Notice, That he had felt ſeveral leſſer Shakes, and heard the Noiſe often; which was very loud, and, by thoſe not uſed to hear it, might be eaſily taken for a ruffling Wind, or hollow rumbling Thunder: But, he ſays, it had ſome puffing Blaſts peculiar to itſelf, moſt like thoſe of a Brimſtone Match, when lighted, but in a much greater Degree, and ſuch as a large Magazine of Brimſtone might be ſuppoſed to make, when on Fire. He adds, that in *Port-Royal*, and many other Places all over the Iſland, much ſulphurous combuſtible Matter had been found, ſuppoſed to have been thrown out, upon the Opening of the Earth; which, upon the firſt Touch, took Fire and burnt like a Candle.

We ſhall conclude the Whole with Remarks on the Weather, both before and after the *Earthquake*. Dr. *Morley* obſerves, that the Year 1692, began with very dry and hot Weather, which continued till *May*, when there was very blowing Weather, and much Rain till the End of the Month. From that Time till the *Earthquake* happen'd, it was exceſſive hot, calm, and dry. We learn, from another Hand, that the Weather was much hotter *after* the *Earthquake* than before; and

that

that there appear'd ſuch an innumerable Quantity of Muſcatoes, as had never been ſeen in the Iſland till then.

An Account of an EARTHQUAKE, *near* Oxford, 1665, *by Dr.* WALLIS, *and Mr.* BOYLE.

ON the 19th of *January*, 1665-6, towards Evening, at divers Places near *Oxford*, was felt a ſmall Earthquake. At *Oxford* itſelf it was not perceiv'd; the Doctor ſays, that about that Time he was ſenſible of a kind of odd Shaking or Heaving in his Study, which he ſuppoſed owing to Carts or Coaches, tho' a little different from what is uſual on theſe Occaſions.

It was perceiv'd at *Blechington*, about five Miles Northwards of *Oxford*, and alſo at *Boſton*, *Horton*, *Stanton St. John*'s, and ſo towards *Whately*, which is four Miles to the Eaſt of *Oxford*: It was not felt at the ſame Time at all theſe Places, but mov'd ſucceſſively from *Blechington* to *Whately*.

Mr. *Boyle* riding between *Oxford* and a Lodging he had four Miles from that Town, in that ſhort Space of Time, from a ſettled Froſt, the Wind turned, and it began to rain. *Soon after his* getting Home, he felt a manifeſt

feſt Trembling in the Houſe, which ſtands high in reſpect of *Oxford*. But he would not have taken Notice of it as an *Earthquake*, unleſs it had been perceiv'd by the People of the Houſe. Soon after there happen'd a briſk Storm; on which he ſent to make Enquiry at a Place call'd *Brill*, which ſtanding higher might be ſuppos'd more liable to the Effects of the *Earthquake*; and he was inform'd it was very conſiderable there; and that a Gentleman's Houſe in the Neighbourhood ſhook very much, ſo that the Stones in the Parlour manifeſtly moved to and fro. The Hill on which this *Brill* ſtands, is ſtored with mineral Subſtances of ſeveral Sorts. Mr. *Boyle* adds, that he has been told, that this *Earthquake* reach'd a great many Miles.

An Account of an EARTHQUAKE *at* Oxford, *by Mr.* THO. PIGOT.

SEPT. 17th, 1683, an *Earthquake* happen'd here at *Oxford*, at a Time when ſuch Effects are commonly experienced, if we may credit *Ariſtotle*, who tells us, that they are moſt frequently in Spring and Autumn; in which there is a greater Abundance of Vapours, and a larger Quantity of Nitre exhaled; all which Ingredients may conſpire to the Production of an Earthquake: For if we

we conſider how capable they are of a large Expanſion, how forcible they are when rarified in cloſe Veſſels over the Fire, we may ſuppoſe, that thoſe Vapours, which produce ſuch great Commotions in the Air, may cauſe conſiderable Diſturbance in the Earth, when pent and lock'd up therein. The latter Part of the firſt Week of *September*, was ſo rainy, that many were apprehenſive of a Deluge; the 9th of *September* there fell ſome very conſiderable Showers in the Afternoon; but from that Time it clear'd up, and to the End of the enſuing Week, it continued very warm and pleaſant Weather; the 16th in the Evening was inclinable to Froſt; and the next Morning it was a very hard Froſt for the Seaſon; and then, about 7 o' Clock, the Day being very clear and calm, the Earthquake happen'd. Dr. *Wallis* and Mr. *Boyle* made the like Obſervations of Cold preceding the Earthquake of 1665-6. The Quickſilver in the Barometer ſtood as high then, as at any Time for three Years before, which, together with a remarkable Calmneſs of the Air, a Matter generally looked upon, as one of the Circumſtances which uſually accompany Earthquakes, and, by many, reckoned among the Signs which precede them, may be ſufficient to ſhew how free the Air was from Vapours at that Time; and ſurely, the fewer there were above, the more may be ſuppoſed *below*; *Ignes fatuus's* were frequently ſeen a

few

few Days before this Earthquake, which, at leaſt, may be a probable Argument to ſhew how full the Earth then was of Damps and Exhalations; ſince a Stench, that tainted Well-water in an unuſual Manner, hath, upon the ſame Account, been generally reckon'd among the Signs of an Earthquake, and by which it may be predicted; for by this it was, that *Pherecydes* is ſaid to have preſaged the Earthquake at *Lacedemon*; and *Helmont* mentions another, who pretended to the ſame Foreſight, by taſting the Water of a very deep Well in the Caſtle of *Louvain*.

The Motion of this Earthquake was not of that Sort, which are termed Pulſes or Succuſſions, ſuch as ſtrike the Ground, at right Angles, with a violent Shock, or intermittent Knocking, ſo as often to raiſe the Earth to a conſiderable Height, or force their Way by a Breach; but it appear'd rather to be ſuch a trembling Motion, as vibrates and ſhakes, without altering the Poſition of the Earth, and leaves all Things in the ſame Poſture in which it found them; for it ſhook the Earth with a tremulous and vibratory Motion, whoſe Reciprocations were repeated with a great deal of Quickneſs; the Pulſes were a little diſcontinued, and yet they came ſo thick, that there was no reckoning of them, though the whole Earthquake continued ſcarce more than ſix Seconds of Time; and when it ended, the *Motion of Reſtitution*, or ſettling of the Build-

ing, in which this Obſerver was, ſeemed to be with a Craſh. Now, as tremulous and vibratory Motions are proper to produce Sounds, ſo was this Earthquake accompanied with a hollow Murmuring, like a diſtant Thunder; which Sound kept Time ſo exactly with the Motion, and was ſo conformable to it, in all Reſpects, that it plainly appears, there was the ſame Reaſon for both; to thoſe that were within Doors it appear'd to be more conſiderable, and, as it were, above in the Air, occaſion'd chiefly by the ſhaking of the Building; but thoſe who were abroad in the Fields and open Air, perceiv'd a hollow Murmur, with a gentle Shaking towards the Surface of the Earth, not unfitly compar'd to the Groaning of ſome Planks of Elm, Aſh, or Fir, when the Application of Fire cauſeth both a Trembling and a Sound. That there is a conſiderable Heat within the Earth, is manifeſt from the Experience of Miners working in the deeper Grooves; from thoſe hot Springs which burſt out thence, and from Fermentations caus'd by mineral Spirits: Nor is it leſs commonly obſerv'd, that ſuch Heats and Fermentations within the Earth are augmented by froſty Weather; when the Streams being more pent up, do work more forcibly upon each other: And that Sounds and Tremors may be produced by ſuch Heat, though it work only on Air, watry Vapours, or Nitre included in Pores

or Cavities, appears from ſeveral Experiments; as that of filling Glaſs Bottles half full with Water and Nitre, which, brought to the Fire, will tremble with a Sort of humming Sound, and after that break with a great deal of Noiſe and Violence.

The Extent of this Earthquake was but 70 Miles, or thereabouts; its largeſt Diſtance was from South-Eaſt to North-Eaſt, the leaſt from North to South, which is a very inconſiderable Space, if compar'd with that which happen'd in the Southern Parts of *Norway*, *April* 24th, 1657, and took up 160 Miles in Length, and as many in Breadth; and *Kircher* mentions one 200 Miles in Length.

There was another Earthquake, far more conſiderable, which happen'd *October* the 9th, about 11 o'Clock at Night, in *Oxfordſhire*, Northwards it was perceived much; it ſpread itſelf over the Mid-land Counties, and extended into *Derbyſhire*; in which, as in the Coal-Countries, it was very violent.

A Chronological Account of the ſeveral Burnings of Mount ÆTNA.

IT has been already obſerved, from Dr. *Liſter*, that the material Cauſe of Thunder, Lightning, and Earthquakes is the ſame.

In order, therefore, to entertain the Reader more agreeably, we shall diversify the Subject, as Occasion offers. For this Purpose we shall give a short Chronological Account of the Eruptions of Mount *Ætna*.

To omit what is related by *Berosus*, *Orpheus*, and other less credible Authors, about the Eruptions of this Mountain, both at the Time of the Expedition of the *Ionian* Colonies, and that of the *Argonauts* into the Island of *Sicily*, which latter happen'd in the 14th Century before CHRIST; the first we shall take Notice of, is that which happen'd at the Time of the Expedition of *Æneas*, who being affrighted at the Burning of this Mountain, left that Island; of which *Virgil* gives this Description, as translated by *Trapp*.

——*And unknowing of our Course*
We drive upon the Cyclop's *Coast*: *The Port*
Fenc'd by its Situation from the Winds,
And large itself: *But* Ætna *thunders nigh*
In dreadful Ruins. With a Whirlwind's Force
Sometimes it throws to Heav'n a pitchy Cloud,
Redden'd with Cinders, and involv'd in Smoke;
And tosses Balls of Flame, and licks the Stars:
Sometimes, with loud Explosion, high it hurls
Vast Rocks, and Entrails from the Mountains torn;
With roaring Noise flings molten Stones in Air,
And boils, and bellows, from its lowest Caves.

After

After this, in the 76th Olympiad, about 1476 Years before CHRIST, we find, in *Thucydides*, another Burning, and about 50 Years after that, a third. And in the Time of the *Roman* Conſuls, according to *Diodorus Siculus*, and *Polybius*, there happen'd four Eruptions of Mount *Ætna*. The next was in the Time of *Julius Cæſar*, and ſaid, by *Diodorus*, to have been ſo fierce, that the Sea about *Liparo*, an Iſland near *Sicily*, by its fervent Heat, burnt the Ships, and kill'd all the Sailors therein. There was another under *Caligula*, about 40 Years after CHRIST, which was ſo dreadful, that it made that Emperor, who was then in *Sicily*, to fly for it. It burnt again, A. C. 814. under *Charlemagne*: And from the Year 1660 to 1669, all *Sicily* was ſhaken with many terrible Earthquakes; the Eruptions of *Ætna* deſtroy'd a vaſt Tract of inhabited Land round about it, and reach'd as far as *Catanea*, whoſe Cathedral, and the Religious in it, were deſtroy'd. In 1284, about the Time of the Death of *Charles* K. of *Sicily* and *Arragon*, there was another dreadful Burning. *Anno* 1329 to 1333, another. *An.* 1408, another; and 1444, another, which laſted to 1447. *An.* 1536, there was an Eruption which continued for a whole Year; and 1633, another, that laſted ſeveral Years. *An.* 1650 it burned on the Eaſt Side, and vomited ſuch Quantities of Fire, as, according to *Kircher*, in his *Mundus Subterraneus*,

made great Devaſtations. And the Author, being in *Sicily*, obſerves, that the People of *Catanea*, digging for Pumice-Stones, found, at the Depth of 60 Foot, Streets pav'd with Marble, and many Footſteps of Antiquity; an Argument that Towns formerly ſtood there, though ſince buried in the Eruptions of that Mountain; they alſo found ſeveral Bridges of Pumice-Stones, probably made by the Flux of theſe fiery Torrents.

Accidents by LIGHTNING, *at* Stralſund *in* Pomerania.

JUNE the 19th, 1670, being *Sunday*, a dreadful Flaſh of Lightning, like a black fiery Ball, darted thro' a large round Hole in the upper Vault of St. *Nicholas* Church, directly upon the Altar, cauſing ſuch a fearful Crack, Flaſh and Smoke, with a ſulphureous Smell, as if ſeveral Fire-balls had been thrown down and burſt all at once; the Candle on the South Side of the Altar was extinguiſh'd by the Blow; two of the Chalices were overthrown, the Wine ſpilt, and the Wafers ſcatter'd about, but the empty Chalice ſtood firm, and all three were ſomewhat ſmutted in the Foot, as likewiſe the Wafer-boxes towards the Bottom; and one of the Chalices *was pierced thro'* in two Places, as if it had been

been by Hail-ſhot; the Church-book was flung in the inner Paſſage; the Covers of the Altar were ſinged in ſeveral Parts, as if it were by Powder, and ſomewhat burnt, and ſmutted here and there, as alſo torn in ſeveral Places; a ſtrong Piece of Wainſcot, with a Picture in it, behind the great Altar, was ſplit in two; but the Braſs and Iron Wires of the whole and quarter Hammers of the Church Clock were partly broken, and the reſt could not be found; and an oaken Poſt, fixt in the Wall for the Support of the Dial, was half torn, and, beneath the ſame, ſeveral Bricks were ſtruck out of the two head Pillars, ſupporting the Steeple; on the Top of the South Steeple an oaken Gutter, and a ſtrong Beam and Supporter were ſhatter'd; one of the Miniſters, though ſitting near the Altar to the South, had no Hurt at all; ſeveral of the People ſeated near the Altar, fell down with the Fright; on the North Side four Perſons fell down; and ſome that ſtood in, or by the Belfrey, near the Clock, were ſlightly hurt here and there; and one leaning on a lined oaken Seat, had his right Arm bruiſed; there iſſued, with great Violence, out of the South Steeple, upon opening the Windows, a great Damp like Smoak; but there appear'd no Fire, ſave a little in the ſhatter'd Parts of the Steeple, which was ſoon quench'd; the Church Dial was ſmutted in ſeveral Parts, ſo that the gilt Figures could not be diſcern'd, as alſo the

the gilt Weather-cocks on the Steeples, on one Side of their Tails. It was afterwards obſerv'd, that of the eight Perſons that were hurt, one who ſtood in the Belfrey, had the upper Part of his Coat, as alſo his Shirt and Skin ſomewhat torn, and yet the Lining of red Frize was not touch'd; he that had his Arm bruiſed, had a Hole through his Coat, Waiſtcoat and Shirt, on the fore-part of his Body, appearing as if ſhot through, yet without the leaſt Hurt; his Waiſtcoat of red Sarcenet kept its Colour every where, except where the Arm was hurt; and the ſmall ſilver Edging was all over ſmutted; one Half of his Shoe was torn off, and the Sole pierced as with Hail-ſhot, and near a Hand's Breadth of the Foot of his Stocking was ſtruck away, without any other Hurt either in Foot or Leg, except that, for ſome Days after, he had a Numbneſs in that Foot. One of thoſe who ſat by the Altar had his Breeches and Leather Drawers pierced thro' on each Side, as with Hail-ſhot, and ſome Parts were viſibly ſcorched and ſhrunk up, as if it were by by Fire, and many of theſe ſmall Holes were obſerv'd in his Shirt, without any Hurt in his Body, ſave a little Pain he felt in his Foot; one Side of his Shoe was torn off, and the Sole was pierced thro' as with Hail-ſhot.

HURRICANES *and* STORMS; *by Mr.* TEMPLER.

OCTOBER 30. 1669, between 5 and 6 o' Clock in the Afternoon, the Wind being Weſterly, there happen'd at *Aſhley* in *Northamptonſhire*, a dreadful Hurricane, ſcarce being ſixty Yards in Breadth, and ſpending itſelf in about 7 Minutes Time. Its firſt Aſſault was upon a Milk-maid, taking her Hat from off her Head, and carrying her Pail many Yards, where it lay undiſcover'd ſome Days. Next it ſtormed the Yard of one *Sprigg*, dwelling in *Weſtharp*, where it blew a Waggon-body off the Axle-trees, breaking the Wheels and Axle-trees in Pieces, and blowing three of the Wheels, ſo ſhatter'd, over a Wall; this Waggon ſtood ſomewhat croſs to the Courſe of the Wind. Another Waggon, of Mr. *Saliſbury*'s, was driven with great Force againſt the Side of his Houſe; a Branch of an Aſh-tree, which two ſturdy Men could ſcarce lift, was torn off from a Tree at 100 Yards Diſtance, and blown over his Houſe; a Slate that muſt have come the Diſtance of 200 Yards, none being nearer, ſtruck againſt an Iron Bar in a Window, and bent it very much. At Mr. *Maidwell*'s it forced open a Door, breaking the Latch, and forcing open

the Dairy Door, it overturn'd the Milk-pails, and ſtruck out three Panes in the Window, and in the Chambers nine Panes more; it tore off a great deal of the Roof of the Parſonage Houſe, and rooted up a Gate-poſt two Foot and an half deep in the Earth, and carried it many Yards off; it blew a large Hovel of Peaſe from its Supporters, and ſet it upon the Ground, without any conſiderable Damage to the Thatch. About a Quarter of a Mile from the Town is a ſmall Wood, on the Top of a Hill, which partly deſcends into a Vale encompaſſed with Hills to the North and South; ſo that the Wind may ſeem confin'd to the Vale as a Channel, before it aſſaulted the Town, and ſo be forced to ſpend itſelf only in that Glade; yet ſome Blaſts from the aſcending Wood-ground, might contribute to this Accident, becauſe the Wind continued, as far as could be judged, as high in the Field afterwards, and the Situation of the Town did expoſe a far greater Part of it to this Damage than was really affected, the Valley being four or five Times the Breadth of that Part of the Town concern'd in it.

Octob. 1670, at *Braybrook* in *Northamptonſhire*, about 11 o'Clock, the Storm attacked a Peaſe-rick in the Field, uncover'd its Thatch, without touching another within 20 Yards of it; it blew up the End of a Barley-rick, with ſome Stakes in it near five Foot long, without hurting a Wheat-rick within ſix Yards of the

the Barley-rick; it afterwards uncover'd the Parſonage-houſe; from whence it paſſed over the Town, without doing any Damage, its Situation being low; at *Fort-hill* it uncover'd as much of a Malt-houſe as lay within its Extent and Breadth. *Braybrook* ſtands in a Valley ſurrounded with Hills on three Sides, at the Diſtance of three Quarters of a Mile; there is a Hill called *Clackhill*, within a Mile of it, and exactly in that Point of the Compaſs in which the Wind then ſtood; and, which is remarkable, there had been two Earthquakes in this Town within theſe ten Years, when the Wind, or, rather, gentle Air, then only vibrated on the Point of the Compaſs.

A remarkable Eruption of Mount ÆTNA, Anno 1669; *communicated to the* ROYAL SOCIETY *by ſome* Engliſh *Merchants.*

ABOUT 18 Days before it broke out, there was a very thick dark Sky, with Thunder and Lightning, and frequent Concuſſions of the Earth; and it was obſerv'd, that the old Top or Mouth of Mount *Ætna*, for two or three Months before, raged more than uſual, as alſo *Volcano* and *Strambilo*, two

burning Iſlands to the Weſtward. It firſt broke out on *March* 11th, 1669, about two Hours before Night, on the South-Eaſt Side of the Mountain, about 20 Miles below the old Mouth, and 10 Miles from *Catania*. At firſt it was reported, to advance three Miles in 24 Hours; but *April* the 5th, it ſcarce mov'd a Furlong a Day, and after this Manner it continued for 15 or 20 Days, paſſing under the Walls of *Catania*, a good Way into the Sea; but about the latter End of *April*, and Beginning of *May*, it bent all its Force againſt that City, and paſſed over the Walls in ſeveral Places; but its chief Fury fell on a Convent of *Benedictines*, with large Gardens between it and the Wall; after filling which Space, it met with ſtrong Reſiſtance from the Convent, which made it ſwell very high; ſome Parts of theſe Walls were driven in, whole and entire, almoſt a Foot. But here its Fury ceaſed the 4th of *May*, running afterwards in little Streams into the Sea; it had overwhelmed, in the Inland Country, about 14 Towns and Villages. The Matter of theſe Streams was nothing elſe, but divers Kinds of Metals and Minerals, liquified by the Fierceneſs of the Fire in the Bowels of the Earth, boiling up, like Water, at the Head of ſome River; and running a little Way, the Extremities began to cruſt or curdle, turning, when cold, into thoſe hard porous Stones, commonly called *Sciarri*, nearly reſembling

ſembling large Cakes of Sea-coal, full of Fire; they came rolling and tumbling, one over another, and when they met with a Bank, would fill up and ſwell over, by their Weight bearing down any common Building, and burning what was combuſtible; its chief Motion was forward, but it would alſo dilate itſelf, like a Flood of Water in a Level, throwing out ſeveral Arms, or Tongues, as they call them. About two or three o'Clock, theſe Obſervers went up to a high Tower in *Catania*, whence they had a full View of the Mouth; a dreadful Sight, to ſee ſuch a Maſs or Body of Fire! They would, next Morning, have gone up to the Mouth itſelf, but durſt not approach nearer than a Furlong, for Fear of being overwhelm'd by a ſudden Turn of the Wind, which carried up, into the Air, ſome of that vaſt Pillar of Aſhes, higher and bigger than St. *Paul*'s Steeple; the whole Air, round about, was cover'd with the lightſt of thoſe Aſhes, blown off from the Top of the Pillar; and, from the firſt Eruption, till it ceaſed, which was fifty-four Days, neither Sun nor Stars were ſeen. From the Outſide of this Pillar, great Quantities of Stone fell off, but not very big; at the Mouth, whence the Fire and Aſhes iſſued, there was a continual Noiſe, like the beating of great Waves againſt Rocks, or like Thunder at a Diſtance; it was ſometimes heard 60 Miles off, and ſometimes 100, to which Diſtance the

the Aſhes have alſo been carried; and ſeveral Sea-men have affirm'd, that their Decks have been cover'd with them at *Zant*. About the Middle of *May*, three Quarters of the City of *Catania* were ſurrounded with theſe *Sciarri*, as high as the Top of the Walls, and in many Places they broke over; the Surface of theſe *Sciarri* are ragged, lying together in great Flakes; their Colour is of a dark duſky Blue. The whole Country, from the Walls of *Catania*, for 20 Miles, is full of theſe old *Sciarri*, which former Eruptions threw up, tho' the People remember none ſo big as the laſt, or that burſt out ſo low. This Country is, notwithſtanding, well cultivated and inhabited; for Length of Time has either mollified many of thoſe old *Sciarri*, or they are cover'd with new Mould or Aſhes, tho' there ſtill remains much Ground, which may, poſſibly, be never made ſerviceable.

An Account of ſeveral MINERALS *thrown up by the Eruption of Mount* ÆTNA.

A Careful Examination of the Matter thrown up by Volcano's, may greatly conduce to a rational Account of theſe Eruptions; for if it be found of an inflammable Nature,

Nature, it may ſoon be kindled by ſome falling Stones; which, breaking in Pieces, may ſtrike Fire, and ſo inflame ſuch combuſtible Materials. Upon examining the Aſhes, taken up in ſeveral Places about Mount *Ætna*, ſome at the Top, or Mouth, ſome a Mile off, ſome four, ſome ten Miles, ſome half a Mile, and ſome on the Skirts of the new-made Mountain; the four firſt were found very dry, like Duſt, but the two latter very moiſt; and theſe two differ from each other, in that one Sort conſiſts of hard and ſmall Lumps, the other of very ſoft dirty Grains, yet both moiſt, and of a vitriolic Taſte. Upon examining the Cinders, called *Sciarri*, ſome were obſerv'd to be coarſer, taken up at ſome Diſtance from the Mouth; and of theſe, ſome were black, with a Cruſt of Brimſtone, and ſome of a red Hue; others were finer, ſaid to be taken out of the Gutters of Fire, at the very Mouth; but theſe Sorts are light; but there is a third Sort of Stone, very ſolid and ponderous, which ſeems to conſiſt of ſeveral Minerals melted together. The third Thing that was examined, was a Piece of Sal-armoniac, and ſeveral Pieces of Sandiver.

This Eruption was obſerv'd to ſpread three Miles in Breadth, and ſeventeen in Length.

Of EARTHQUAKES *in* Sicily, *by Mr.* MARTIN HARTOFE.

IT ſeems highly probable, that theſe Trembligs of the Earth proceed from the ſame inflammable Matter, which, finding a Way, at other Times, thro' *Mongibello*, break out ſo furiouſly in Fire and Smoak. The Eruptions of theſe Mountains are of two Sorts; the one not ſo violent, as very much to diſturb the adjacent Country; and this happens once in two or three Months, and laſts three or four Days; the other is more furious, and of longer Continuance, and is obſerv'd at *Naples* to happen to Mount *Veſuvius* once in about 80 Years; that in 1632 was ſo very violent, that it threw Rocks three Miles into the Air. Now, from the burning or not burning of this Hill, *Naples* concludes its Safety or Danger from Earthquakes; for, doubtleſs, the Matter is continually burning under the Mountain; and thoſe vaſt Clouds of Smoak, which daily iſſue out at the Top, if the Cavity happen, by any Rock, or inward Alteration, to be ſtopped, muſt deviate thro' other Paſſages under Ground, heaping up there continual Magazines for a future Calamity. Now, this combuſtible Matter ſeems to be nothing elſe but Nitre, mixed with ſome other Mine-

rals

rals and Sulphur; for he that has ſeen the Method of making of Tartar by Deflagration, where an equal Quantity of pulverized Nitre is mixed, has an exact Type of theſe burning Hills; for after each Spoonful that is put into the burning Crucible, there firſt ariſes a black thin Smoak, after which the fired Mineral burns up, as if it would run over the Top of the Crucible.

The Motion of the Earth is not from the Perpendicular, but Horizontal, as appears by the Cracks in the Earth, which are now to be found all over *Sicily*; it is a Vibration ſo quick, that it cracks the Glaſs in the Windows, and the Reciprocations of a Luteſtring are not more frequent than it; now when the Vibrations are ſo quick, and the Body moved ſo large, the Motion muſt be prodigiouſly violent.

An Account of an EARTHQUAKE *in* Sicily, *by* VINCENTIUS BONAJUTUS.

THE continual fiery Eruptions of *Ætna*, of which the firſt we have an Account, happen'd 500 Years before the Deſtruction of *Troy*, according to *Diodorus Siculus*, have been taken for the moſt probable Cauſes of the

horrible Shocks, that have, from Time to Time, laid waſte the Iſland of *Sicily*.

On the 10th of *January* 1693, there happen'd an Earthquake, whoſe Motion was of that Sort, which *Ariſtotle* and *Pliny* call the firſt Species, and which they compare to the ſhaking Fit of an Ague, cauſing ſuch a Motion as ſhakes the Earth from Side to Side. In this Shock almoſt all the Edifices in the Country were thrown down, of which ſome were very high and ſtrong built Towers; a great Part of the City of *Catanea*, with many others, was demoliſh'd, and a great many Buildings in *Val di Noto*; *Syracuſe* was alſo much ſhatter'd, but not ruin'd. This Earthquake was not preceded by any Darkneſs in the Air, but by an agreeable, ſerene and warm Seaſon; which was the more obſervable, as being unuſual at that Time of the Year. The preceding Evening there was a great Flame or Light obſerv'd at about the Diſtance of an *Italian* Mile, and ſo bright, that it was taken for a real Fire made by ſome of the Country People; and it ſeemed to the Spectators ſtill to keep at the ſame Diſtance, tho' they went directly towards it. Whilſt they were obſerving this Appearance, the Earthquake began, upon which the Light quite vaniſh'd, and the Waves of the Sea, which, before the Shock, beat gently on the Shore, began now to make a dreadful Noiſe. The next Day, the Air was overſhadow'd with Darkneſs, and

tinged

tinged with a deep Yellow, and the darkened Sun ſtruck the Minds of the Spectators with the melancholy Preſage of the approaching Earthquake, which was the ſecond, and happen'd the 11th of *January*, and laſted about four Minutes; it was much like the ſecond Sort, which *Ariſtotle* and *Pliny* call a Pulſe or Stroke, from its Reſemblance to the Beating of an Artery, and by *Poſſidonius*, in *Seneca*, is repreſented by the Name of Vibrations, it being a perpendicular Lifting up of the Earth. This Shock affected *Sicily* all over, and its Impulſe was ſo vehement and powerful, that not only many Cities, and ſeveral Parts of the Kingdom of *Naples*, but alſo the Iſland of *Malta* ſhared in its Fury. It was impoſſible for one to keep on his Legs, and even thoſe who lay along on the Ground, were toſſed from Side to Side, as if on a rolling Billow. In open Places the Sea ſunk down conſiderably, and in the ſame Proportion in the Ports and incloſed Bays, and the Water bubbled up all along the Shore. The Earth open'd in ſeveral Places in very long Clefts, ſome an Hand's Breadth, others half a Palm, and others like great Gulfs. From thoſe Openings in the Valleys there iſſued out ſuch a Quantity of Water as overflow'd a great Space of Ground, which, to thoſe that went near it, had a ſenſible ſulphureous Smell. In the Plain of *Catanea*, from one of thoſe narrow, but very long Clefts, and about four Miles off the Sea,

the Water was thrown out altogether as Salt as that of the Sea. In the City of *Noto*, a Street, half a Mile in Length, and built of Stone, was ſettled into the Ground, and hung quite on one Side, like an inclining Wall; and in another Street, before the *Aſſent dal Durbo*, was an Opening big enough to ſwallow a Man and Horſe. There were every where great Rocks looſen'd and thrown down from the Mountains; and in the Country of *Sortino*, a great Number periſh'd in their Houſes, which were beaten down by the Rocks in their rolling down the Hills. At *Syracuſe*, and other Places near the Sea, the Water in many Wells, which at firſt were ſalt, became freſh, and fit to drink; the Fountain *Arethuſa* was ſo brackiſh, for ſome Months, that its Water could not be uſed, but afterwards it became ſweeter, and its Spring was increaſed to near the double. In the City of *Termini* all the running Waters were dried up, but the hot Baths were augmented by a third Part of what they were before the Earthquake. In many plain and level Places, very high Walls leaped from their Foundations above two Paces, leaving that whole Space perfectly clear and free from Rubbiſh, as if they had been taken up, and carried off. A Fountain, in the very Moment of the Earthquake, ejected its Waters tinged of a Blood-red for three Hours, and then it dried up, leaving many Holes in the

Mud

Mud at Bottom, thro' which real Aſhes were thrown out, and the next Day the Waters return'd of their former Quality, without the leaſt Alteration. The South Winds blew very much, which ſtill have been impetuous in the moſt ſenſible Earthquakes; and from the 11th of *January* to the 14th of *September* there were conſiderable and ſtrong South Winds, preceded by a Noiſe like a Cannon at a great Diſtance, ſometimes of a longer, and ſometimes of a ſhorter Continuance. It has been obſerv'd, that in leſs ſolid Ground, ſuch as Chalk, Sand, looſe Earth, the Damage was incomparably greater than in rocky Places; its Effects on human Bodies have been various, ſuch as Fooliſhneſs, hypocondriac, melancholic and choleric Diſorders. Fevers were very common, with continual tertian and malignant Agues, accompanied with *Deliria* and Lethargies; the Small-pox made great Havock among Children; and, in ſhort, no Age or Condition but had its Share in ſo univerſal a Calamity.

An Account of an EARTHQUAKE *in the North of* England, *by Mr.* THORESBY.

THERE was an Earthquake felt at *Hull*, upon the 28th of December 1703, about

about three or four Minutes after five in the Evening. It heav'd up Chairs and Tables, and made Pewter Diſhes and the Windows rattle, ſhook whole Houſes, and threw down Part of a Chimney; the Shock came and went ſuddenly, and was attended with a Noiſe like Wind, though there was then a perfect Calm. It was felt in much the ſame Manner at *Beverly*, and other Places, and particularly at *South Dalton*; it was more violent near *Lincoln*, where it heav'd up the Chairs People ſat on, *&c.* It was felt pretty much at *Selby*, as alſo near *Navenby*; the ſudden Noiſe of which ſeem'd to be like the Rumbling of two or three Coaches driven furiouſly, and it ſhook the Chairs on which People ſat; and even the very Stones were ſeen to move. A little before, there was a violent Storm; and at *Leeds* there was a much greater Storm the preceding Night, and next Day, than was in the South Parts of *England*.

An Eruption of FIRE *near* Fiorenzola; *by Dr.* ROB. ST. CLAIR.

DR. *St. Clair* receiv'd an Account from his Brother, that on the Side of one of the *Appenine* Mountains, half Way betwixt *Bologna* and *Florence*, near a Place call'd *Petra mala*, about five Miles from *Fiorenzola*, there

there is a Spot of Ground about four or five Miles Diameter, which inceſſantly ſends up a Flame riſing very high, without Noiſe, Smoak, or Smell; yet it gives a very great Heat, and it has been obſerv'd to be thus at all Times, except when great Rains fell, which put it out for a Time; but when it is over, it burns with greater Heat and Vigour than before; the Sand about it, when turned up, ſends forth a Flame; but within three or four Yards of it, there grows Corn all round about; for it continues always in the ſame Spot. The Flame ſeems to proceed from a Vein of *Bitumen* or *Naphtha*, that crops, as the Miners call it, only here; which when, by plowing, or ſome other Accident, the upper Cruſt has been turned up, was kindled into a Flame, by the Heat and Agitation of the Air, as other ſaline ſulphureous Bodies are, of which Mr. *Boyle*'s Phoſphorus is a particular Inſtance; the like ſpontaneous Accenſion is in many mineral Subſtances, but none, that I know of, ſo quick in its Production, or ſo laſting, as this is; the whole Woods and Fields have been deſtroy'd by it; the Neighbours there have been ſo little curious to obſerve it, that they believ'd, there was a great Hole in the Place the Flame proceeded from, but the Doctor's Brother found it to be firm Ground; neither does any there remember when, or upon what Occaſion it firſt began.

The flaming Well, near *Wigan*, ſeems to proceed

ceed from a Cauſe much like this, in which you may boil an Egg, and upon the Approach of a lighted Candle, it takes Fire; both ſeem to proceed from a *Naptha*, or ſubtil *Bitumen*, only that it is in a hotter Country, and in a dryer Soil, is more ſubtil and inflammable; juſt as the *Petroleum* (Rock Oil) which is found in *Italy*, is white, like Spirit of Turpentine, and is more penetrating than the *Petroleum* which is found in more Northern Countries. An Inſtance of which we have in a Well two Miles diſtant from *Edinburgh*, call'd *Bauline Well*, of a blackiſh-red Colour, and very black; but being diſtilled, does in Colour, Taſte and Smell, reſemble that of *Italy*. The ſpontaneous Accenſion of the *Naptha* ſeems to be made out by the Smell our *Bitumen*, near *Edinburgh*, yields, being almoſt like Coal-ſmoak. There are three ſuch Fires on the ſame Hills, that are extinguiſh'd in the Summer, but burn in the Winter; the Reaſon of which, the Doctor judg'd to be this, that the Bowels of the Earth being cooler in the Summer than in the Winter, do not ſend forth that Quantity of thoſe ſubtil Exhalations, as may be ſufficient to maintain a Flame in Summer; but in Winter the Bowels of the Earth being hotter, which is evident by the Smoaking of Springs in the Winter, and not in Summer, and from the Experience of Miners, when greater Plenty of Steams are ſent forth, which are agitated in the Air

into

into a Flame, the briſk Motion of the Parts, one againſt another, being promoted by the Subtilty and briſk Agitation of the aerial Particles, that mutually aſſiſt each other.

Prognoſticks and Cauſes of HURRICANES; *by Capt.* LANGFORD.

IT hath been the Cuſtom of the *Engliſh* and *French* Inhabitants of the *Caribbee* Iſlands, to ſend, about the Month of *June*, to the native *Caribbees* of *Dominico* and St. *Vincent*, to know whether there would be any Hurricanes that Year; and about 10 or 12 Days before the Hurricane came, the Natives conſtantly ſent them Word, and it very ſeldom or ever fail'd; from one of theſe *Indians* the Captain had the following Prognoſticks. 1. All Hurricanes come either on the Day of the Full, Change, or Quarter of the Moon. 2. If it will come on the Full Moon, you being in the Change, then obſerve theſe Signs; that Day you will ſee the Skies very turbulent, the Sun more Red than at other Times, a great Calm, and the Hills clear of Clouds, or Fogs over them, which in the Highlands are ſeldom ſo; likewiſe in Hollows, or Concaves of the Earth, or Wells, there will be a great Noiſe, as if you were in a great Storm, and at Night the Stars looking very big with

Burrs about them, and the North-weſt Sky very black and foul, the Sea ſwelling ſtronger than at other Times, as uſually it doth in great Storms, and ſometimes for an Hour or two that Day, the Wind blows very hard Weſterly, out of its uſual Courſe. On the Full Moon you have the ſame Signs, with a great Burr about the Moon, and many Times about the Sun; the like Signs muſt be taken Notice of in the Quarter Days of the Moon, in the Months of *July*, *Auguſt*, and *September*, for the Hurricanes come in thoſe Months; the ſooneſt the Captain heard of, was the 25th Day of *July*, and the lateſt was the 8th of *September*; but the uſual Month they come in, is *Auguſt*.

The Benefit the Captain had of foretelling theſe Hurricanes, was, that whereas, heretofore, they were ſo dreadful, that all Ships were afraid to go to Sea, and rather choſe to ſtay in the Roads at Anchor, than to run the Hazard of the mercileſs Sea, although never a Ship eſcap'd at Anchor, but was caſt aſhore many Times by the Violence of the Storm, ſome Veſſels have been caſt ſo far on the Shore, that when the Storm was over, they have been from 20 to 30 Yards from the Waſh of the Shore, and the Veſſels ſet whole, by which the Lives of thoſe that were in them were ſaved. But the Captain finding, that if a Man keeps his Ships ſailable, with good Store of Ballaſt, his Ports well barred and cauked,

cauked, his Top-maſts down, and his Tops too, if he have Time, his Yards laced a-port, keeping the Doors and Windows of his Ship faſt, ſhe will lie as well as in other Storms; and they may, having their Ships in Readineſs, ſtay in the Road till the Storm begins, which is always firſt at North, ſo to the North-Weſt, till it comes round to the South-Eaſt, and then its Fury is over; ſo that, with the North Wind, they may run away to the South, to get themſelves Sea-room for the Driſt of the South-Weſt Wind, where it blows very fiercely. By theſe Means the Captain, with God's Bleſſing, preſerv'd himſelf in two Hurricanes at Sea, and in three on Shore; in thoſe at Sea he did not loſe a Sail, Yard, or Maſt, tho' they were great Hurricanes.

The Reaſons and Cauſes of theſe violent Storms, according to the Captain's Judgment, may be theſe. 1. It is known to all Men of Experience, that, to the Southward of the *Tropic*, there is conſtantly a Trade-wind, which goes about from the North to the South-Eaſt all the Year over, except where there are Reverſions of Breezes, and Inlets near the Land; ſo that when this Hurricane, or rather Whirlwind, comes in Oppoſition to the conſtant Trade-wind, then it pours down with that Force and Violence, that it exceeds all Storms of Wind in the World; for it takes Trees away by the Roots, and thoſe that are extraordinary ſtrong rooted,

it twiſts off in the Middle. In a Hurricane at *Nevis*, the Captain ſaw a high Mountain that was all green with Trees, left in moſt Places bare, and the Wood lying in ſuch a Condition, with half Trees, or Stumps, or Quarters, that one would think it almoſt incredible. 2. It is remark'd by all Men, that have been in thoſe Parts where the Sun comes to the *Zenith*, that at its Approach towards it, there is always fair Weather; but at his Return to the Southwards, it generally occaſions, off the North Parts of the *Equinoctial*, much Rain and Storms, as *Tornado's*, and the like, which makes the Wind in the *Tornado's* come on ſeveral Points; but before it comes, it calms the conſtant eaſterly Winds, and when they are paſt, the eaſterly Wind gathers Force again, and then the Weather clears up fair. 3. The Wind being generally towards the *Tropics* eaſterly, unleſs at ſuch Times as before declar'd, meeting with the Oppoſition of theſe Hurricanes, which come in a contrary Courſe to that Trade-wind, cauſes the violent Whirlwind, upon the Sun's leaving the *Zenith* of *Barbadoes* and the adjacent Iſlands, by which the eaſterly Wind doth loſe much of its Strength, and then the Weſt Wind, which is kept back by the Power of the Sun, pours down, with the greater Violence and Force, upon thoſe Parts where it gets Vent; and it's uſual, in ſailing from *Barbadoes*, or the Iſlands thereabouts, to the North, for a weſterly Wind,

when

when they begin to loſe the eaſterly Wind, to have it calm, as is uſual before Hurricanes; and then the Wind ſpringing up, till it comes to be well ſettled, cauſes the Weather to be various; but after the ſettled weſterly Wind comes freſh, they have been conſtantly without thoſe Shufflings from Point to Point.

Here it is be obſerv'd, that all Hurricanes begin from the North to the Weſtward, and on thoſe Points that the eaſterly Wind blows violently, the Hurricane blows moſt fiercely againſt it; for from the N. N. E. to the E. S. E. the eaſterly Wind blows freſheſt; ſo doth the W. N. W. to the S. S. W. in the Hurricane blow moſt violent; and when it comes back to the S. E. which is the common Courſe of the Trade-wind, then its Violence ceaſes, and ſo breaks up. And thus the Captain took the Cauſe of the Hurricanes to be the Sun's leaving the *Zenith* of thoſe Parts towards the South; and ſecondly, the Reverſe or rebounding back of the Wind, which is occaſion'd by the calming of the Trade-wind, to proceed from the ſame Cauſe.

But it will be objected, why ſhould not this Storm be all over the *Weſt-Indies*, as well as *Barbadoes* and the *Leeward* Iſlands? To which the Captain anſwers, that it had, in about 25 Years of his Experience, taken its Courſe from *Burmudas*, or the *Summer* Iſlands to the *Caribbee* Iſlands, but ſeldom or never doth it reach ſo far, as from the Latitude of 16 to 32 Degrees,

grees, which are the Latitudes of one and the other Place; but it has been obſerved, that when Hurricanes have been in *Martinico*, which is within two Degrees of Latitude, and two Degrees of Longitude, according to the Miles of that Circle, yet no Hurricane hath been at *Barbadoes*. Again, it has been obſerved, that Hurricanes have done the like to the Northwards; for when the Hurricane hath been at *Antegoa* and St. *Chriſtopher*'s, thoſe Ships that were in the Latitude of 20 Degrees, had no Hurricane, but conſtant weſterly Winds, reaſonably fair, and then there were no Hurricanes in *Bermudas*; and when the Hurricanes were at *Bermudas*, the *Leeward* or *Caribbee* Iſlands had none; nor had thoſe Iſlands the Hurricane when *Barbadoes* had it.

It may be farther objected, why the Hurricane was never known to go farther to the Weſtward than *Porto-Rico*, which lies in or near the Latitude of thoſe Iſlands of St. *Chriſtopher*'s. To this he anſwers, that from *Porto-Rico* downwards, that both that, as well as *Hiſpaniola*, and other adjacent Iſlands, are of vaſt Greatneſs, and have very high Lands, that of themſelves give Reverſal, or weſterly Winds, at Night, thro' the Year; for there, for theſe Reaſons aforeſaid, the eaſterly Wind, toward Night, doth calm, thoſe Lands afford a Land-wind, which the other Iſlands cannot do, by Reaſon of the Smalneſs of thoſe *Caribbee* Iſlands, but very near the Shore, the Trade-

Trade-wind has its full Force, till this general Whirlwind comes, for the Reaſons aforeſaid. He imagines likewiſe, to the Southwards of *Barbadoes*, where the *Tornado's* come frequently, there are no Hurricanes; nor was there any at *Barbadoes* when theſe *Tornado's* commonly came there, which made ſome ſmall Reverſal, though it was but for two or three Hours; yet the eaſterly Wind, giving ſome Way, by the Sun's declining to the *Zenith*, prevents this furious Reverſe, where it hath no Vent, till it was forced by the Violence of the two Winds.

WATER-SPOUTS *in the* Mediterranean; *by Dr.* STUART.

AS the Bowels of the Earth contain Abundance of ſulphurous and combuſtible Materials, which, by their Junction and Coalition, cauſe vaſt Exploſions and Earthquakes; ſo the Regions of the Air are no leſs pregnant with the ſame Kind of ignitive and ſulphurous Matter, and produce as aſtoniſhing Effects. In the laſt Section we gave an Account of the prodigious Power of the Wind when raiſed into a Hurricane; in this we ſhall entertain the Reader with another extraordinary *Phænomenon* in Nature, generated in the Air,

Air, and very ſurprizing to the Spectator; I mean, *Water-Spouts.*

Dr. *Stuart* being, on the 27th of *Auguſt* 1701, upon the Coaſt of *Barbary*, to the Northward of the Town of *Bona*; upwards of 10 Leagues at Sea, about 7 o' Clock at Night, ſoon after Sun-ſet; there appear'd in the N. E. which was directly up the Gulf of *Lyons*, great and continual Flaſhes of Lightning, one after another, hardly without Intermiſſion; and thus it continued till next Morning without Thunder, the Flaſhes of Lightning ſometimes reſembled the ſudden Appearance of a Star, at other Times, of a flaming Sword, and again, of a Silver Cord, ſtretch'd along the Clouds, or the irregular Cracks of a Phial from Top to Bottom. About Eight next Morning they had Thunder, with a Continuation of Lightning, ſuch as above-mention'd, all from the N. E. or thereabouts. About Nine the ſame Morning, there fell from the Clouds, which look'd diſmally black, louring, and, as it were, heavy with Rain, in the ſaid N. E. Quarter, three *Water-Spouts*; that in the Middle, ſeem'd as big as the Maſt of a Ship, and the Doctor judg'd it to be diſtant, at leaſt, a League and an Half; the other two were one Half ſo big; all of them were black, like the Cloud from which they fell, and ſmooth, without any Irregularity, only that, at firſt falling, ſome fell perpendicularly, others obliquely, and all of them were

ſmaller

ſmaller at the lower than at the upper End, repreſenting a Sword; ſometimes alſo one of them would bend, and become ſtreight again, and ſometimes become narrower, and again increaſe its Bulk; ſometimes it would diſappear, and immediately fall down again; at other Times it would be extenuated to the ſmallneſs of a Rope, and again become large as before. There was alſo a great boiling up of the Sea, as in a *Jette d'eaux*, or Water-work; and this riſing of the Water had the Appearance of a Chimney ſmoaking in a calm Day; ſome Yards above the Surface of the Sea, the Water ſtood like a Pillar; and this ſpreading itſelf, it was diſſipated like Smoak; and the Sword-like Spout from the Clouds, either came down to the very Middle of this Pillar, as if it had been join'd to it, as the largeſt Pillar, which fell perpendicularly down, always did from the Beginning to the End; or elſe pointed to this Column of Water, at ſome Diſtance, either in a perpendicular, or oblique Line, as did the other two leſſer ones. There were three or four Spouts more, which appear'd at the ſame Time in the ſame Quarter of the Heavens, but not like the three former, either in Bulk or Duration. Thoſe laſt appear'd and diſappear'd ſeveral Times, during the Continuance of thoſe three aforeſaid. It was hardly diſtinguiſhable, whether the Sword-like Spout firſt fell down from the Cloud, or whether the Pillar of Water firſt

roſe from the Sea; both appearing oppoſite to each other all of a ſudden; only the Doctor obſerv'd of one of them, that the Water boil'd up from the Sea to a great Height, without the leaſt Appearance of a Spout pointing thereto, either perpendicularly or obliquely; and here the Water of the Sea never came together in the Form of a Pillar, but roſe up in a ſpreading Manner, the Sea boiling round the Place; the Wind being then N. E. the ſaid Boiling advanced towards the S. W. as a flitting or moving Buſh upon the Surface of the Sea, and at laſt it ceaſed. This ſhews that the boiling, or flying up of the Water of the Sea, may begin before the Spout from the Cloud appears; and, indeed, if there is any ſmall Matter of Priority betwixt theſe two Appearances, the boiling or throwing up of the Sea has it; which firſt begins to boil, and then forms itſelf into a Pillar of Water, eſpecially on the lower Part thereof. It was obſervable of all of them, but chiefly of the large Pillar, that, towards the Extremity, it appear'd like a hollow Canal, only black in the Borders, but white in the Middle; and tho' at firſt it was altogether black and opaque, yet one could diſtinctly perceive the Sea-water flying up along the Middle of this Canal, as Smoak does up a Chimney; and that with very great Swiftneſs, and a very perceptible Motion; and then, ſoon after, the Spout, or Canal, broke in the Middle, and diſappear'd

by

by little and little; the boiling up, and the Pillar-like Form of the Sea-water, continuing always the laſt, even for ſome conſiderable Time after the Spout diſappear'd; and, perhaps, till the Spout appear'd again, which it commonly did in the ſame Place, as before, burſting and forming again ſeveral Times in a Quarter, or Half an Hour.

The Doctor ſuppoſes, that this Phænomenon may be ſolv'd by Suction, or rather Pulſion, as in the Application of a Cupping-glaſs to the Fleſh, after the Air is exhauſted by the kindled Flax. It was further obſervable, that the oblique Spouts always pointed from the Wind; that is, when the Wind was at N. E. the oblique Spouts always pointed to the S. W. tho' at the ſame Time there were others perpendicular, which ſtill continued ſo, notwithſtanding the Wind; as alſo, that ſuch as were curved, had ſtill the convex Side from the Wind, and the concave Side towards it; that is, the Wind being at N. E. the Concave was towards the N. E. and the Convex towards the S. W. It rain'd a great deal during the Continuance of theſe Spouts, and after their total diſappearing, there was Half an Hour's violent Storm from the N. E. with very little Rain; and after that the Weather clear'd up.

A WATER-SPOUT *at* Hatfield *in* Yorkſhire; *by Mr.* ABRAHAM DE LA PRYME.

ON the 15th of *Auguſt* 1684, about Two o'Clock in the Afternoon, there appear'd a *Water-Spout* in the Air at *Hatfield* in *Yorkſhire*; it was about a Mile off, coming directly towards the Place where Mr. *De la Pryme* was. The Seaſon was very dry, the Weather extremely hot, the Air very cloudy, the Wind aloft, and pretty ſtrong; and what was remarkable, it blew out of ſeveral Quarters at the ſame Time, and fill'd the Air thereabouts with very thick black Clouds, in different Layers. This blowing of the Wind ſoon caus'd a great Vortex, Gyration, and Whirling among the Clouds, the Center of which, every now and then, dropt down, in the Shape of a thick, long, black Tube, commonly call'd a Spout; in which was plainly perceivable a Motion like that of a Screw, continually drawing and ſcrewing upwards, as it were, whatever it touch'd. In its Progreſs it mov'd ſlowly over a Hedge-row and Grove of young Trees, which it caus'd to bend, like Haſel Winds, in a circular Motion; then advancing forwards to a large

Barn,

Barn, it twitch'd off, in a Minute, all the Thatch, and fill'd the whole Air therewith; and coming to a very large Oak, it made it bend like the aforeſaid Trees, and broke off one of the ſtrongeſt and largeſt Branches, and twiſting it about, flung it to a conſiderable Diſtance off; then coming within 300 Yards of him, Mr. *De la Pryme* beheld this extraordinary Phænomenon, and found that it proceeded from a Gyration of the Clouds, by the meeting of contrary Winds in a Point or Center; and where the greateſt Condenſation or Gravitation was, falling down into a large Pipe or Tube, ſomething like the *Cochlea Archimedis*; and in its whirling Motion, it either ſucks up Water, or deſtroys Ships, *&c.* Having gone about a Quarter of a Mile farther, it was diſſolv'd by the Prevalency of the Wind, which was eaſterly.

Mr. *De la Pryme* likewiſe gives an Account of another Water-Spout that happen'd at *Hatfield*. He ſays, though the Weather, in *June*, had been, in this Part of the Country, exceeding wet and cool, yet *Monday*, the 21ſt of the ſaid Month, was pretty warm, and about two o' Clock that Afternoon, no Wind ſtirring below, tho' it was ſomewhat ſtormy up higher in the Air, the Clouds began to be mightily agitated and driven together; whereupon they began to be very black, and were very viſibly hurried round, from whence there proceeded a moſt audible whirling Noiſe. Some

Time after, there deſcended a long Tube, or Water-Spout, from the Center of the congregated Clouds, wherein there was a ſwift ſpiral Motion, like that of a Screw, or the *Cochlea Archimedis*, when in Motion. It proceeded ſlowly from W. to N. E. broke down a large Oak, and frighten'd the Labourers out of the Field, and made others lie flat upon their Faces, to eſcape being whirled about, and killed, as they ſaw had happen'd to ſeveral Jackdaws, that were ſuddenly ſnatch'd up, carried out of Sight, and then thrown a great Way off. At length it paſs'd over the Town of *Hatfield*, filling the whole Air with the Thatch it took off from ſome of the Houſes; then touching upon the Corner of the Church, it tore up ſeveral Sheets of Lead, and rolled them together in a ſtrange Manner; and ſoon after it diſſolv'd and vaniſh'd, without doing any further Miſchief. There was nothing more extraordinary in this Water-Spout, than in that which we have juſt given an Account of; and by all the Obſervations which Mr. *De la Pryme* could make of both, he found, that had they been at Sea, and join'd to the Surface thereof, they would have carried up a vaſt Quantity of Water into the Clouds; and then the Tubes would have become much more ſtrong and opaque than they were, and have continued much longer.

It is commonly ſaid, that at Sea the Water *collects*, and bubbles up a Foot or two high under

under the Spouts before they join: But this is a Miſtake, owing to the Pellucidity and Fineneſs of thoſe Tubes, which, undoubtedly, touch the Surface of the Sea, before any conſiderable Motion can be produced therein; and that when the Tube begins to fill with Water, it then becomes opaque and viſible. As for the Reaſon of their diſſolving of themſelves, after that they have ſuck'd up a great Quantity of Water, Mr. *De la Pryme* ſuppoſes to be owing to the great Quantity carried up, which muſt needs thicken the Clouds, impede their Motion, and, by this Means, diſſolve the Tubes.

An Account of the Eruption *of a* BURNING SPRING, *at* Broſeley, *in* Shropſhire, *by Mr.* HOPTON.

ABOUT *June* 1711, at *Broſeley*, near *Wenlock* in *Shropſhire*, (about two Nights after a remarkable Day of Thunder) there was heard a terrible Noiſe in the Night, which awaked ſeveral People; who coming to a boggy Place under a little Hill, about 200 Yards off the River *Severn*, perceiv'd a mighty Rumbling and Shaking in the Earth, and a little Boiling of the Water thro' the Graſs; upon digging up ſome Part of the Earth, the

Water

Water flew up immediately to a conſiderable Height, and was ſet on Fire by a lighted Candle. To prevent the Spring being deſtroy'd, an Iron Ciſtern was placed round it, with a Cover upon it, to be lock'd down, and a Hole in the Middle, thro' which one might ſee the Water. If you put a lighted Candle, or any Thing of Fire, to this Hole, the Water immediately takes Fire, and burns like Spirits of Wine, and continues ſo to do as long as you keep the Air from it; but by taking up the Cover of the Ciſtern, it quickly goes out: The Heat of this Fire much exceeds that of any other Fire Mr. *Hopton* ever ſaw, and ſeems to have more than ordinary Fierceneſs in it. Some People, after they have ſet the Water on Fire, have put a Kettle of Water over the Ciſtern, in which green Peaſe, or a Joint of Meat, are much ſooner boil'd, than over any artificial Fire; if green Boughs, or any other Thing that will burn, be put upon it, it preſently conſumes them to Aſhes. The Water of itſelf is as cold as any other Water Mr. *Hopton* ever felt; and what is remarkable, as ſoon as ever the Fire is out, if you put your Hands into it, it feels as cold as if there had been no ſuch Thing as Fire near it.

An Account of the Eruption *of Mount* VESUVIUS, *in* 1707, *by* S. VALETTA.

THE Eruptions of this Mountain are ſo frequent and continual, that they are almoſt innumerable; ſo that there does not paſs a Month, much leſs a Year, wherein it does not break out with more or leſs Violence, and do more or leſs Damage. The greateſt Eruption that hath happen'd, for ſome Time, was that in 1707, when, in the Height of Summer, in the latter End of *Ju-*, Mount *Veſuvius*, that had been quiet for ome Time, began to ſhew ſome Signs of an Eruption: For, at firſt, thoſe internal Bellowings were heard, which reſounded in the very Center of the Mountain, yet without any moak or Flame; then it began, by Degrees, o emit Smoak and clear Fire, which, eſpeially in the Night-time, illuminated all *Cam-ania*. In the mean Time, at different Interals, it made ſuch a terrible Noiſe, that the Reports of our largeſt Guns are ſcarce to be ompar'd therewith. Then it began to roll s Aſhes for ſeveral Days and Nights, carrying them aloft every Way into the Air, and iſperſing them into different Quarters, ac-

cording as the Wind happen'd to blow; ſometimes into the Sea, at other Times, into the adjacent Territories of *Stabia*, *Nola*, and *Acerra*; and, what was very remarkable, a prodigious Shower of Stones, that deſtroy'd both Men and Cattle; after this it began to belch out, at its gaping Mouth, a liquid Torrent of Bitumen, call'd *Glarea*, or Grit; which, at firſt, appear'd like a gentle Stream of Fire, deſcending with the ſame ſlowneſs of Motion, as is obſervable in melted Pitch, or the like viſcid Subſtances. This Matter, which reſembled molten Glaſs, as it cool'd in its Progreſs, became as hard as Stones. It was obſervable, that the ſuperior Surface of this Matter, as it cool'd, was converted into ſmall ſpongy Stones, but its lower Surface, into a broad, hard, ſolid Flint, (long uſed in paving the Highways) as if what lay next the Air had admitted and retain'd ſome of its Particles, while its lower Part became a ſolid, compact Maſs, without any Vacuities. Moreover, there were two that had not been obſerv'd for ſeveral Ages before; for, about the third or fourth Day, it began to emit, at its Mouth, Flaſhes of Lightning, almoſt like thoſe ſometimes obſerv'd in the Air, but in a Serpentine Form; and, withal, very loud Claps of Thunder were heard, ſo thick and frequent, that, at firſt, it was thought it would rain, till it was perceiv'd they proceeded from the *Mountain*, and that the dark Clouds di-

nor

not conſiſt of Vapours, but of large Quantities of Aſhes. In the mean Time, on the 2d of *Auguſt*, at four in the Afternoon, there was ſuch a thick Cloud of Aſhes hovering over *Naples*, as intercepted the Rays of the Sun; and the Darkneſs was ſo great, that the People could not diſtinguiſh, in the very Streets, their Neighbours and Friends; in a Word, no Midnight Darkneſs exceeded it; if any adventured Abroad with Torches, they were obliged to return Home again; which only happen'd once before, in the Emperor *Titus*'s Time, according to *Xiphilis*: So that every Place was fill'd with the Shrieks of Women; but the more Prudent betook themſelves to Prayer to Almighty God, and with Apprehenſions expected the Event of ſuch a Prodigy. Both the Magiſtracy and Clergy appointed Supplications to be made, and to carry in Proceſſion to the *Capuan* Gate, which regards the Mountain, the Relict of St. *Januarius*, the tutelar Saint of this City; whither when they were come amidſt the palpable Darkneſs of the Day, at laſt, about the firſt or ſecond Hour of the Night, towards the North, where, perhaps, there was not ſo great a Quantity of Aſhes, a Star or two were ſeen, and the azure Face of the Heavens began to appear, and afterwards the Darkneſs that had obſcured the Day, gradually to diminiſh in the Night; and the Aſhes, by the ſhifting of the Wind, to be driven into the Sea. The following Day con-

tinued ſomewhat dark, by Reaſon of the Remains of the Aſhes diſperſed in the Air. *Veſuvius*, having thus covered the Fields with Aſhes, and belched out its Grit for ſeveral Days, ſo that its black Torrent had almoſt reached the neighbouring Sea, at length, in about 15 Days, it was ſeen to ceaſe. Upon this the *Neapolitans*, to perpetuate the Memory of *Januarius*, whom they always found propitious to them in their Calamities, ſtruck a Medal of Gold and Silver, with *Januarius's* Head on one Side, and this Legend,

DIVO JANUARIO LIBERATORI URBIS FUNDATORI QUIETIS.

In *Engliſh* thus:

To St. Januarius, *the Deliverer of our City, the Founder of our Quiet.*

And on the Reverſe, Mount *Veſuvius*, with this Inſcription,

POSTQUAM COLLAPSI CINERES ET FLAMMA QUIEVIT CIVES NEAP. INCOLUMES. A. MDCCVII.

In *Engliſh* thus:

After the Aſhes were fallen, and the Flame had ceaſed, the Citizens of Naples *were ſafe. In the Year* 1707.

An

An Account of a STORM *of* RAIN, *that fell at* Denbeigh *in* Wales.

UPON *Tueſday* the 16th of *July* 1706, about Eight o'Clock in the Morning, it began to rain in and about *Denbeigh*, and continued inceſſantly for 30 Hours, but not very violently till about three or four o'Clock on *Wedneſday* Morning, when it rain'd ſomewhat faſter, attended with a terrible Noiſe, like Thunder, with ſome Flaſhes of Lightning, and a boiſterous Wind. About Break of Day, the Wind and Rain began gradually to abate every Hour, till one or two o' Clock in the Afternoon, and then it perfectly ceas'd, and the Air became clear, and ſomewhat calm. On *Tueſday* the Wind blew S.W. but on *Wedneſday* it was come to the N. W. The Effects of this great Storm were diſmal; for it caus'd the over-flowing of all the Rivers in *Denbighſhire*, *Flintſhire*, and *Merionethſhire*, &c. which ſpoil'd a great deal of Corn, and carried off all the Hay that was mow'd down near the Banks of the Rivers, in ſuch vaſt Quantities, that it choak'd the Arches and Inlets of the Bridges, and broke down a Dozen large ones: Oaks, and other large Trees, were rooted up, and ſwept away, with ſeveral Quickſet Hedges, and ſome Quillets, by the Side of the River.

River *Elwy*, were ſo cover'd with Stones and Gravel, that the Owners could not well tell, whereabouts their Hedges and Land-marks ſtood. And this River alter'd its Channel; and two or three Rivulets, that convey'd Water to ſome Mills, were choak'd up with Stones and Gravel. It was affirm'd by ſeveral People, that the great Floods were not ſo much the Effects of Rain, as the breaking out of a vaſt Number of Springs in ſuch Places as they were never known to flow from before. In the Town of *Denbigh* a great many broke out in Houſes and Stables, eſpecially in that Part next the Caſtle, on the North Side; and ſome of them with a great deal of Violence, and in ſuch Quantities, that it was averred by ſeveral Men of the Town, that three of theſe new Springs, which flow'd out of the *Bull*, *Croſs-keys*, and *Boar's-head*, were ſufficient to turn any Corn-mill. At a ſmall Diſtance Northward of *Denbeigh*, lies *Park-ſnoding*, a rocky Hill, where there broke out a great many Springs, which flow'd ſo plentifully for nine or ten Days, that the Cattle were watered in them for all that Time; whereas, before and after, the People were oblig'd to water them, all Summer long, at a Well in the Highway, at ſome Diſtance from *Park-ſnoding*. There were ſeveral deep Holes and Trenches cut in the Highways, adjoining the River *Elwy*, &c. and ſome of them very large; which was not attributed ſo much to

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the overflowing of the River, as to the breaking out of Springs in thoſe very Places. In *Comb* Mountain there was a Pit of a circular Form, which, in the Summer-time, was wont to have little or no Water in it, and in the Winter as much Water as would ſwell the Surface to about 14 or 16 Yards; but now, in the Middle of Summer, it roſe up, at leaſt, a Yard and a half higher than it was ever known to have done in the wetteſt Winters; and, overflowing its Banks, it fell down the Hill with ſuch Violence, as to penetrate into the very Body of a rocky Road, and dug large Pits into it, ſo that this common Highway was become irreparable.

An Account of the ſtrange Effects of THUNDER *and* LIGHTNING; *by* SAMUEL MOLYNEUX, *Eſq;*

MRS. *Cloſe* gave Mr. *Molyneux* the following Account of the Thunder and Lightning, which happen'd at her Houſe, at *Newforge*, in the County of *Down*, in *Ireland*, on the 9th of *Auguſt* 1707. She obſerv'd, that the whole Day was cloſe, hot, and ſultry, with little or no Wind ſtirring, till towards the Evening; that there was a ſmall Breeze, with ſome miſling Rain, that laſted about

about an Hour; that as the Air became darkened after Sun-ſet, ſhe ſaw ſeveral faint Flaſhes of Lightning, and heard ſome Thunder-claps, as at a Diſtance; that between 10 and 11 at Night, both were very violent and terrible, and ſo increaſed, and came on more frequent, till a little before 12 o' Clock; that a Flaſh of Lightning, and a Clap of Thunder, came both at the ſame Time, louder, and more dreadful than all the reſt, which, as ſhe thought, ſhook and inflam'd the whole Houſe; and then perceiving a very ſtrong ſulphureous Smell in her Chamber, and feeling a groſs Powder falling thick on her Hands and Face, as ſhe lay a-bed, ſhe concluded, that Part of her Houſe was either beaten down by the Thunder, or ſet on Fire by the Lightning; that getting up, and calling for a Candle, ſhe found her Bed-chamber full of Smoke and Duſt, as alſo the Kitchen that was beneath it; that then ſhe only obſerv'd the Looking-glaſs, which hung in her Chamber, to be broken; but that, next Day, ſhe found Part of the Top or Cornice of the Chimney, that ſtood without the Gabel-end of the Houſe, where her Chamber was, had been ſtruck off; that Part of the Coping of the Splay of the Gavel-end itſelf was broken down, and 12 or 16 Shingles of the Roof adjoining thereto, raiſed or ruffled, but none ſhatter'd or carried away; that Part of the Cieling in her Chamber, beneath thoſe Shingles, was forced down, and

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Part of the Plaiſter and pinning Stones of the adjoining Wall broken off and looſen'd, and the whole Breach 16 or 20 Inches broad; that, at this Place, there was left on the Wall a ſmutted Scar or Trace, as if blacken'd by the Smoak of a Candle, which pointed downwards, towards another Place on the ſame Wall, whereon a Breach was made, like the former, and of the ſame Dimenſions, part of which was behind the Place where the Looking-glaſs hung; that the Boards on the Back of a large hair Trunk, full of Linen, ſtanding beneath the Looking-glaſs, were forced in and ſplinter'd, as by the Blow of a Smith's Sledge; that two Thirds of the Linen in this Trunk were pierced or cut through, the Cut appearing of a quadrangular Figure, and between two or three Inches over; that one Side of the Trunk was forced out, as the Back was drove in; that about two Foot Diſtance from the End of the Trunk (where the Floor and Side-wall of the Houſe joined) there was a ſmall Breach made in the Plaiſter, and a ſmall Chink, or Crevice, to be ſeen, ſo wide that a Man might thruſt his Fingers down; and that, juſt beneath this, in the Kitchen, the Cieling was forced down, and ſome of the Lime or Plaiſter of the Wall broken off; that exactly under this there ſtood a large Tub, or wooden Veſſel, incloſed with a Crib of Brick, or Lime, which was broken, or ſplinter'd all to pieces, and moſt of the Brick

or Lime-work it ſcatter'd about the Kitchen. The Looking-glaſs was broken with that Violence, that there was not a Piece to be found of the Bigneſs of Half a Crown; that ſeveral Pieces of it were ſticking, like Hail-ſhot, in the Chamber-door, which was of Oak, as alſo on the other Side of the Room; that ſeveral of the Edges and Corners of ſome of the Pieces of the broken Glaſs were ting'd of a light flame Colour, as if heated in the Fire; the Curtains of the Bed were cut into ſeveral Pieces, which was ſuppoſed to be done by the Pieces of Glaſs; that ſeveral Pieces of Muſlin and Linen, left on a Trunk, were thrown about the Room, no way ſinged or ſcorched; and yet the Hair on the Back of the Trunk, where the Breach was made, was ſinged; that the uppermoſt Part of the Linen, within the Trunk, was not touched, and the lowermoſt Parcel, conſiſting of upwards of 350 Folds of Linen, was pierced through, of which none was any way ſmutted, but the uppermoſt Fold of a Table-cloth that lay over all the reſt; that there was a yellow Singe or Stain perceivable on ſome Part of the damag'd Linen, and that the whole ſmelt ſtrong of Sulphur; that the Glaſs of two Windows in the Bed-chamber above, and two Windows in the Kitchen below, was ſhatter'd in ſuch a Manner, as that ſcarcely one whole Pane was left in any of them; that the Pewter, Braſs, and Iron Furniture in the Kitchen, were thrown down,

down, and ſcatter'd about, particularly a large Gridiron of 20 Pound Weight, that hung upon an Iron Hook, near the Cieling, was found lying on the Floor; that a Cat was found dead, next Morning, in the Kitchen, with its Legs extended in a moving Poſture, and with no other Sign of Hurt, than that the Fur was ſing'd a little above the ſetting on of the Tail. It was farther obſervable, that on the Wall, both above and below a little Window, a Mark was to be ſeen, as if it had been the Blow of a Smith's Sledge, or large Iron Crow, whereby a Splinter of the Stone, weighing ſome Pounds, was broken off. Mr. *Molyneux* was farther inform'd, that from the Time of that great Thunder-clap, both the Thunder and Lightning diminiſh'd gradually, ſo that, in an Hour's Time, all was ſtill and quiet again.

An Account of a New Iſland, *raiſed near* Sant-Erini, *in the* Archipelago; *by Dr.* WILLIAM SHERARD.

DR. *Sherard* had an Account of this *New Iſland*, from the *Engliſh* Conſul at *Milo*, as follows, *viz.* That on the 12th of *May*, 1707, *N. S.* an Iſland began to riſe up, a

Muſket-ſhot from the Iſland of *Sant-Erini*, which continually increaſing, from Day to Day, in the ſame Manner, and troubling the Sea, there roſe up ſeveral Rocks, that fixed themſelves to this Iſland; ſo that, on *June* the 11th, it was about Half a Mile in Circumference.

From the *Paris Gazette*, *April* 14th, 1708, they write from the Iſland of *Sant-Erini*, in the *Archipelago*, about 28 Leagues North from the Town of *Candia*, of the 1ſt of *December* laſt, that there ſprung up an Iſland from the Bottom of the Sea (which is very deep at that Place) formed of Stones, caſt up by a Volcano, which has often produced the ſame Effects, and after the ſame Manner. In the Year 726, in the Time of the Emperor *Leo Iſauricus*, an Iſland was formed on the North Side, called the *Burnt Iſland*, by Matter thrown up, and heaped together by the Volcano. In 1427, in the Month of *December*, this *Burnt Iſland* was increaſed by Rocks caſt up by ſubterraneous Fires. In 1650, in the Month of *September*, the Volcano again took Fire, and produced the ſame Effects, without forming any Iſland, only a Shelve or Bank 10 Fathoms under Water. Laſtly, in the Month of *November* 1707, the Volcano made an Iſland, which is already two Miles in Circumference, which ſtill increaſes by Rocks, and other new Matter that is thrown up. This Burning was perceived,

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as at all other Times, by violent Earthquakes, followed by a thick Smoke that roſe out of the Sea in the Day-time, and Flames in the Night, and accompanied with a terrible Roaring under Ground. There is no Inſtance of the Effects of any Volcano at Land, like thoſe in the Sea; and yet what renders them the more credible, is, that the Iſland of *Sant-Erini* itſelf, is almoſt all of it compoſed of burnt Rocks and Pumice Stones; it produces ſome Sorts of Grain, but has neither Rivers nor Springs, nor any other Water, but what is preſerved in Ciſterns.

A further and more particular Account of the New Iſland, *thrown up near* Sant-Erini; *by* F. BOURGUIGNON.

ON *Monday* the 23d of *May* 1707, O. S. at Sun-riſing, we obſerved, between the two *Burnt Iſlands*, commonly called the *Great* and *Little Kammeni*, a floating Rock, as it were; which, at firſt, we took to be ſome Veſſel Ship-wreck'd on that Coaſt, and ſeemed as if it would, in a little Time, be daſh'd to Pieces againſt the *Leſſer Kammeni*, that was hard by; on which Account ſome Mariners *put out* immediately to Sea, in order to view it

it. Soon after we were ſurprized to hear, by them, that it was a Shoal beginning to ſpring up from the Bottom of the Sea, and was not yet plainly to be diſcerned. Next Day, ſeveral Perſons went, out of Curioſity, to ſatisfy themſelves; ſome of them went aſhore on this new Shoal, which was ſtill moving, and ſenſibly increaſed under their Feet. They carried from thence ſeveral Curioſities, and, among others, a Kind of Oyſters, very large, and of an exquiſite Taſte, which they found ſticking to the Rock, and raiſed out of the Water, as the Shoal had increaſed in Height; particularly, F. *Bourguignon* obſerved a Sort of Stone, that, at firſt ſight, looked much like Biſket, but, in Reality, was no other than a very fine Pumice Stone, ſurpaſſing all he ever ſaw in *France*, or any other Parts of *Europe*.

Two Days before the ſpringing up of this Shoal; *viz.* on the 21ſt, between Twelve and One o' Clock at Noon, there was an Earthquake felt over all the Iſland, which could not reaſonably be aſcribed to any other Cauſe, than the riſing up of this Maſs of Rock. From its firſt Appearance, to the 13th or 14th of *June*, it continually increaſed very ſenſibly, as well in Bigneſs as in Height, without any Noiſe or Diſturbance. This Shoal was very pleaſant to look on, being of a white Colour and round Figure; the Soil that compoſed it was light, with a ſmall Mixture of Clay.

Clay. This *New Iſland*, according to the Report of ſome learned and ſkilful Perſons, that were upon it the Beginning of *June*, was Half a Mile in Circumference, and from 20 to 25 Foot high; for five or ſix Days it did not increaſe ſo ſenſibly as before; inſomuch, that moſt People were perſuaded it had entirely ceaſed, and ſo were free from farther Apprehenſions; yet, afterwards, the Sea, already much agitated by the raiſing up of this Maſs of Earth, appear'd more troubled every Day than other, not ſo much by reaſon of this Shoal being remov'd, and ſtill floating, as on Account of the Mixture of a vaſt Quantity of different Matters continually thrown up, Night and Day, from the Bottom of the Sea, ſo that a Perſon might eaſily diſtinguiſh ſeveral Sorts of Minerals, by the Diverſity of the Colour they produced on the Surface of the Water; but Sulphur was the greateſt Quantity, inſomuch that the Sea about *Sant-Erini*, was tinged with it, for near 20 Miles Diſtance; the exceſſive rolling of the Waves, about the new Shoal, was greater than ever, and a more than ordinary Heat was ſenſible to any one that approached too near; which, undoubtedly, was the Cauſe of ſuch Quantities of Fiſh being found dead on the Shore. Every Body felt a horrible Stench, that infected the neighbouring Air, and which, at more than three Miles Diſtance, was often found of dangerous Conſequence; the Boil-

ing of the Water, inſtead of decreaſing, grew every Day conſiderably greater; this ſtruck every Body with freſh Apprehenſions, which were farther increaſed, when on *Friday*, *July* the 10th, at Sun-ſet, they perceived, between this Iſland and the *Leſſer Kammeni*, a Chain of black Rocks, as it were, that roſe up from a prodigious Depth of the Sea, to the Number of 17 or 18, not very diſtinct from each other, and join themſelves to this *New Iſland*, as they actually did ſome few Days after. Next Day, being *Saturday*, they were ſeen very plainly; and thoſe whoſe Tops could only be ſeen the Night before, now appeared exceeding large. On *Saturday* the Smoak was firſt obſerved to break forth, much reſembling, in Thickneſs and Colour, that of a burning Furnace, and at the ſame Time were heard certain Murmurings under Ground, which ſeemed to proceed from the Center of this *New Iſland*, as yet no deeper in the Sea, to be plainly diſtinguiſhed; the Rocks above mentioned united together, and ſeemed already to form another Iſland, diſtinct from the former; the Smoak appeared more plentiful, and the Fire, at laſt, began to break forth about the 19th of *July*. It was ſmall at firſt, and of a dull Colour; afterwards it increaſed by Degrees, as the Iſland increaſed and broke out more and more, and in different Places. It was no leſs frightful and ſurprizing, than curious to the Sight, to ſee,

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every Night, on the Top of this Mount, that Nature had lately formed a vaſt Number of burning Furnaces, as it were, all of a bright Flame, in Order and Poſition not unlike thoſe Illuminations of the *Minarets*, which the *Turks* uſually make at certain Times of the Year.

One Night, at the latter End of *July*, about an Hour after Sun-ſet, there appeared, of a ſudden, in the middle Region of the Sky, a fiery Lance, ſeeming to come from Eaſt to Weſt; but it diſappearing again too ſoon, its Dimenſions could not be exactly obſerved. In the mean Time the *Burnt Iſland* increaſed prodigiouſly, and extended itſelf, chiefly on the South and North Sides; the Sea alſo ſeemed much more diſturbed, and was loaded with Sulphur and Vitriol; the Boiling of the Sea was more fierce and violent, the Smoak became thicker, and in greater Abundance, and the Fire larger, and more frightful. But, above all, a Stench, which infected the whole Country, became ſo intolerable, that Perſons of the ſtrongeſt Conſtitutions could hardly breathe in it; others that were weaker, fell into frequent Faintings, and almoſt every Body was ſeized with Vomiting. It was, ſometimes, more in one Place than in another, and more or leſs tolerable, as the Wind ſet. This Stench was very prejudicial, ſpoiling of the Vines, and a great Smoak, that roſe out of the Midſt of this Iſland, joining itſelf to a thick Fog, that commonly hangs over Santi-

Erini, when the Wind is at South, burnt and deſtroy'd, in the Beginning of *Auguſt*, in leſs than three Hours Time, all the Fruit that was ripe, and ready to be gather'd in; eſpecially in ſuch Vineyards as lay moſt expoſed to the South.

In 13 or 14 Days Time, there was a conſiderable Alteration in theſe two new Iſlands; the white Iſland, that did not ſeem to increaſe any more, was now grown conſiderably higher, and the black Iſland was become much longer; both of them, tho' different in Colour, were now united together, and formed but one Iſland, as they remain at this Time. The Fire and Smoak had made new Vent-holes, and the Noiſes under Ground were more frequent and audible; and, from the Midſt of the Iſland, Peals were heard, as of ſo many large Cannon diſcharged, and, at the ſame Inſtant, a large Quantity of burning Stones was ſeen thrown into the Air. Theſe furious Diſcharges made the Doors and Windows, and ſometimes the beſt built Houſes, ſhake; and, more than once, F. *Bourguignon* ſaw Stones all on Fire, darted into the Air out of Sight, and afterwards fall like a Bomb, and be quenched in the Sea, at more than five Miles Diſtance. When theſe Diſcharges happen'd, which were as loud as thoſe of a Cannon, commonly a great Flaſh of Fire, like Lightning, immediately enſued; and, after *that*, there ſprung up, very ſwiftly, a black

and diſmal Smoak, mixed with Aſhes, and ſo prodigiouſly thick, that, when ſpread in the Air, it formed a thick Cloud of ſeveral Colours; which, by Degrees, diſſolving into a fine Duſt, fell, like Rain, on all the neighbouring Country, and more particularly, *Sant-Erini*, where it was ſo plentiful, that the Ground was often cover'd therewith. The Noiſe grew ſtronger, and was louder than if ſix or ſeven Cannon had been diſcharg'd at once; the Fire made itſelf, every Day, more Vent-holes, and became more dreadful. Every Night Nature repreſented a great Variety of Scenes, as the Fire broke forth in different Forms; ſometimes burning Aſhes ſpread themſelves in the Air, like a Plume of Feathers, which falling again upon the Shoal, made it appear all of a light Fire. At other Times one would take it to be the actual diſcharging of ſo many Mortar-pieces, which ſhot entire Rocks, like ſo many Bombs, capable of deſtroying the largeſt Ships; though, for the moſt part, theſe Stones were of a middle Size, yet in ſuch Quantities, that he often ſaw this little Iſland all cover'd with them, and pleaſantly illuminated therewith.

Theſe dreadful Diſcharges were leſs frequent at the latter End of *Auguſt*, but increaſed in *September*, and happen'd daily in *October*, and afterwards became almoſt inceſſant. It is true, the Noiſe was not ſo loud, nor the Stones caſt up ſo large, nor in ſuch Quanti-

ties; the Boiling and Agitation of the Water was much abated; the Sea began to recover its former Colour; the Stench that was before inſupportable, was very little for ſix Weeks; yet the Smoak grew every Day thicker, blacker, and in greater Abundance; the Fire was greater than ever, and ſeemed ſometimes to ſtrike the very Sky; the ſubterraneous Noiſe was become continual, and ſo violent, that it could not be diſtinguiſh'd from Thunder. In a Word, this New Iſland grew every Day more curious, more dreadful, and leſs acceſſible, and was ſo far from ceaſing to increaſe, at the Approach of Winter, that it was ſeen continually increaſing on the South-weſt Side, where Nature ſeemed as if ſhe laboured to make a large Port for Ships; and on the 20th of *November* it appeared to be, at leaſt, three Miles in Circumference, and 40 Foot high.

The Account of the 'foregoing New raiſed Iſland *continued; with many ſurprizing Particulars relating thereto, not before mentioned; by F.* GOREE.

WE ſhould not dwell ſo long upon the Deſcription of this *New raiſed Iſland*, but that it explains and illuſtrates the princi-

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pal Subject of this Treatiſe, *Earthquakes*, and ſhews the true Cauſe of theſe terrible Convulſions of Nature.

Among the Prodigies of Nature, ſays F. *Goree*, we may juſtly reckon an Iſland which aroſe from the Bottom of the Sea, in the Bay that forms the Harbour of *Sant-Erini* in the *Archipelago*; eſpecially if we conſider the Situation, Manner, and all the other Circumſtances of the Formation of this *New Iſland*: For, what can be more ſurprizing, than to ſee Fire not only break out of the Bowels of the Earth, but alſo make itſelf a Paſſage through the Waters of the Sea, without being extinguiſh'd? Or, what can be more extraordinary, or foreign to our common Notions of Things, than to ſee the Bottom of the Sea riſe up into a Mountain above the Water, and become ſo firm an Iſland, as to be able to reſiſt the Violence of the greateſt Storms? And tho' ſubterraneous Fires, when pent in a narrow Paſſage, may raiſe up a Maſs of Earth, as big as an Iſland; yet, that this ſhould be done in ſo regular a Manner, that the Water of the Sea cannot any Ways penetrate into, nor extinguiſh them; that the Fire itſelf, after having made ſo many Vent-holes and Paſſages, ſhould, notwithſtanding, retain a Force ſufficient to raiſe up ſo large a Maſs; and, in fine, that after the Fire is extinct, this Maſs ſhould not fall, nor ſink down again by its own *Gravity*, but ſtill retain the ſame Height

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the Fire had raiſed it to: This is what ſeems to F. *Goree*, more ſurprizing than any Thing that has been related of Mount *Gibel*, *Veſuvius*, or any other Volcano.

Yet this is not the firſt Time that theſe Prodigies have been ſeen at *Sant-Erini*: For if it be not true, that this Iſland itſelf, which was antiently called *Thera*, was, in like Manner, raiſed out of the Sea (as *Pliny* aſſures us it was) it is, at leaſt, moſt certain, that three other ſmall Iſlands (two of which lie within the Bay of *Sant-Erini*, and the third a little without it) have been formed, and raiſed up above the Sea by ſubterraneous Fires. The firſt of theſe Iſlands, which was antiently called *Hiera*, becauſe it was, as is ſuppoſed, dedicated to *Pluto*, is now called *Megali Kammeni*, that is, *the great Burnt Iſland*. *Juſtin*, L. 30. C. 4. ſpeaking of the firſt War of the *Romans* with the *Macedonians*, and of the two Months Truce, which *Philip* King of *Macedon*, and Father of *Perſes*, then demanded, and which he obtain'd, according to *Salianus*, the 4th Year of the 145th Olympiad, and the 196th before the Birth of our LORD, tells us, that this Iſland roſe up from the Bottom of the Sea, this very Year, after an Earthquake. It became as big again in the Year of our LORD 726, by the joining of another Iſland thereto; which, according to *Theophanes*, a *Greek* Author, alſo roſe out of the Sea, and *raiſed itſelf* exactly to the ſame Height with

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the Iſland *Hiera*, and united ſo well to it, that, at this Time, there remains no other Mark of its joining, than only a Cleft or Fiſſure, which reaches from one End of the Iſland to the other, and in ſeveral Places is not Half a Foot broad. The ſame Thing happen'd a ſecond Time in the Year 1457, as appears by a *Latin* Inſcription on a Marble at *Sant-Erini*, but with this Difference, that the ſubterraneous Fire, after being raiſed to the Height of five or ſix Foot above the Water, a vaſt Quantity of Rocks, which formed a Space about a Mile in Circumference, open'd a Paſſage for the Sea-water to enter, whereby it was extinguiſh'd; and the Middle of that Space remained ſo low, that the Sea flowing into it by a ſubterraneous Canal, formed there a ſmall Lake, which continues to this Day. As to the ſecond Iſland, which is a little without the Bay, and called, in *Greek*, *Alproniſi*, or the *White Iſland*, becauſe the Earth with which it is cover'd, is White, like Lime. *Pliny*, who lived in the Time of the Emperor *Veſpaſian*, ſays, that it roſe out of the Sea, and appear'd in his Time. The third Iſland, which is the leaſt, and called, by the *Greeks*, *Mikri Kammeni*, or *the leſſer Burnt Iſland*, was formed in the Year 1573, according to the Account of ſeveral old People, who had learned it of their Anceſtors; and it is between this Iſland, and the *Great Kammeni*, that, on the 23d of *May*, N. S.

N. S. in the Year 1707, at Break of Day another new Iſland was firſt diſcover'd.

Five Days before it appeared, *viz.* on the 18th of *May*, between 1 and 2 o'Clock in the Afternoon, there was an Earthquake at *Sant-Erini*, which was not violent, and continued but a Moment; and in the Night, between the 22d and 23d, there was another, which was ſtill leſs ſenſible than the former. It is natural to ſuppoſe, that the new Iſland then firſt began to move, and raiſe itſelf from the Bottom of the Sea; yet if we conſider, that theſe two Earthquakes were not violent, and laſted but a Moment; that the Sea was, in this Place, from 80 to 100 Fathoms deep, it ſeems difficult to believe, that in five Days Time it could riſe to this Height. What inclines F. *Goree* to think the contrary, is, that its Height, then above the Surface of the Sea, and which it did not arrive to in leſs than three Years Time, was much leſs than that from the Bottom of the Sea to the Surface of the Water. Add to this, that a long Time before theſe Earthquakes, the Fiſhermen perceived a Stench every Time they paſſed by that Place, which ſhews, that the Iſland had then begun to move; yet it is very certain, that there were not any other Earthquakes at *Sant-Erini* than thoſe, which, 14 or 15 Years before, continued for ſeveral Days, and were very violent.

However

However it was, ſome Seamen diſcover'd this Iſland very early in the Morning; but not being able to diſtinguiſh what it was, went immediately to it, but return'd as haſtily back again, and ſpread the Report over the Iſland; which was the more readily credited, becauſe all the Inhabitants knew, and ſeveral had, themſelves, ſeen, what happen'd in the Year 1650. There was then a new Iſland, like this, which roſe up between the Iſlands of *Sant-Erini*, *Nio*, and *Andro*, by Means of ſubterraneous Fires, which cauſed ſeveral violent Earthquakes, accompanied with a roaring Noiſe under Ground, ſulphureous Exhalations, an unſupportable Stench, and black Smoak, which roſe out of the Sea with Flames to the Height of 10 or 12 Cubits; the Sea was then toſſed backward and forward, in ſuch a Manner, by the terrible Shocks of the Earth, that it overflow'd and deſtroy'd 30,000 Perches of Land in *Sant-Erini*; and the Air was ſo infected with Exhalations from the Fire, that 25 Perſons, and a great many Beaſts were ſtifled. At length, when this Iſland had not above 8 or 10 Fathoms of Water to riſe, ſo as to appear above the Surface of the Sea, the Force of the ſubterraneous Fire was ſo violent, as to open a Paſſage before its Time; whereby the Water of the Sea, entering in like a Torrent, extinguiſh'd the Fire, and this Maſs of Earth and Stones did not riſe any higher.

How great ſoever the Apprehenſions of the Inhabitants of *Sant-Erini* were at the firſt Sight of this new Iſland, yet, a few Days after, not ſeeing any Appearance either of Fire or Smoak, ſome of them took a Reſolution to go and view its Situation, which they did accordingly, and went on Shore upon it. They paſſed from one Rock to another, on which they met with ſeveral remarkable Curioſities; and, among the reſt, a Sort of white Stone, that cut like Bread, and reſembled it ſo well, in Form, Colour, and Conſiſtence, that, were it not for its Taſte, any one would take it for real Bread. There was alſo a great Quantity of freſh Oyſters, which they found ſticking to the Rocks. While they were buſy about this, they perceiv'd the Iſland move and ſhake under their Feet; in ſhort, the Riſing of the Iſland was viſible to the Eye, and it increaſed not only in Height, but alſo in Length and Breadth; tho' it was already between 15 and 20 Foot high above the Sea, it could not yet be ſeen from the Mountain *Merovigli*, or the Caſtle of *Scaro*, which ſtands upon the Shore, by reaſon the *Leſſer Kammeni* lay between, and hinder'd the Sight; but 15 Days after, they began to ſee it from *Merovigli*, and in a few Days after that, from the Caſtle of *Scaro*, ſituated upon another Mountain; whence we may judge how much this new Iſland grew in a few Days.

As the Motion, by which this Iſland increaſed every Day in Height, was ſometimes equal, and at other Times unequal, in reſpect to all the Parts of ſo large a Maſs, ſo it did not always riſe equally on every Side. It often happen'd, that while it grew in Height and Length on one Side, it ſunk down and decreaſed on the other. One Day F. *Goree* ſaw a Rock riſe out of the Sea, at 40 or 50 Paces diſtant from the Iſland, which he continued to obſerve for ſome Days together; at the End of which it ſunk again into the Sea, and did not appear any more; but this was different from what happen'd to ſome others, which having diſappear'd as this did, reappear'd again ſome Time after.

The *Leſſer Kammeni*, which lies very near, was often ſhaken with the Motion which raiſed this new Iſland; from a ſmall Cleft, obſerved on the Top of the little Iſland, ſometimes Stones would break looſe, which rolling down its Sides into the Sea, would raiſe a Cloud of Duſt like Smoak. At this Time the Sea, or Gulph, or Bay of *Sant-Erini*, chang'd its Colour ſeveral Times. At firſt it appear'd green, afterwards reddiſh, and ſome Time after of a yellowiſh Colour, with a Stench, which, ſpreading itſelf over a great Part of *Sant-Erini*, gave Reaſon to think, that this Colour was only owing to the Sulphur, with which the Sea was cover'd. The Smoak appear'd firſt on the 16th of July, at which

Time, from a Place in the Sea, where they aſſured F. *Goree* they could never find any Bottom, and which was upwards of 60 Paces diſtant from the new Iſland (which they then called the *White Iſland*) there aroſe a Ridge of black Stones, which the *Greeks*, by Reaſon of their Hardneſs, call'd *Sideropetres*, or Iron Stones, forming another Iſland, called by the Inhabitants, the *Black Iſland*, and which was afterwards not only the Center of the Iſland, but alſo of the Fire, Smoak, and great Noiſe that was heard ſome Time after. The Smoak that iſſued out of this Ridge of Rocks, or *Black Iſland*, was very thick and white, as if it had proceeded from five or ſix Lime-kilns joined together, and being carried by a North Wind towards the Caſtle of *Acrotiri*, it went into the Houſes of the Inhabitants, but without cauſing any great Annoyance, becauſe it had no very great Stench. Four Days after the Smoak had thus appear'd, they ſaw, in the Night-time, Fire iſſuing out of the ſame Place.

The Inhabitants of *Sant-Erini*, eſpecially thoſe of the Caſtle of *Scaro*, began to be apprehenſive, having Fire and Smoak continually before their Eyes; yet the Fire was then but very little, not being above the Breadth of the Mouth of a Furnace, and did not appear in the Day-time, only in the Night from Sun-ſetting to Sun-riſing; and was ſo far from ſpreading the whole Length of the Ridge

of

of Stones above-mentioned, that it poſſeſſed but a ſmall Part of it, which was always, after that, the common Paſſage for the Smoak and Fire.

As to the firſt, or *White Iſland*, neither Fire nor Smoak were to be ſeen, yet it continued to grow larger; but the *Black Island* increaſed much faſter. Huge Rocks were daily ſeen to riſe on each Side of it, which made it ſometimes longer, and at other Times broader, and, by their Height, could be very nearly judg'd the Number of Feet it roſe every Day or Night. Sometimes theſe Rocks joined themſelves to the Iſland, and at other Times they were at a Diſtance from it; ſo that, in leſs than a Month, there were four little *Black Islands*, which, in a few Days after, united together, and ſeemed but one Iſland.

As the Smoak increaſed very much, and there was no Wind ſtirring, it roſe up to the Middle Region of the Air, ſo as to be ſeen at *Candia*, *Naxos*, and other Iſlands, and in the Night-time it appear'd all of a Flame 15 or 20 Foot high; the Sea, at that Time, was cover'd with a Matter, or Froth, which in ſome Places was reddiſh, and in others yellowiſh, from whence there proceeded ſuch a Stench over the whole Iſland of *Sant-Erini*, that, for Fear of being infected, ſeveral Perſons were oblig'd to burn Incenſe, and others to make Fires on the Tops of their Houſes, to *diſperſe it*, and purify the Air; but it did

not

not continue above a Day and a half; for a ſtrong South Wind aroſe, which, together with the Motion of the Sea, did indeed diſperſe this frothy Matter, but occaſion'd, otherwiſe, great Damage to the beſt Part of the Iſland of *Sant-Erini*. At that Time they were in great Hopes of having a very plentiful Vintage, when this Wind carried all the Smoak upon their Vineyards, which burnt them up in ſuch a Manner, that the Grapes, which were not yet ripe, became, in a Night's Time, like dried Raiſins; ſo that, afterwards, they were oblig'd to throw them away, becauſe of their Sourneſs. Nor was this the only Effect occaſion'd by this thick Smoak; for, it is farther remarkable, that Silver and Copper were thereby turned black; and tho' ſome People, who were oblig'd to paſs thro' the Smoak, in going to their Houſes, aſſured F. *Goree*, that it had no very bad Stench, yet ſeveral of them were, that, and the next Day after, troubled with great Pains in their Heads.

At this Time the *White Iſland*, which ſeemed to be above the *Leſſer Kammeni*, and could be ſeen, from the firſt Floor of the Houſes in the Caſtle of *Scaro*, ſunk down ſo low, that it could not be ſeen from the ſecond.

Hitherto the Sea had not been obſerv'd to boil up, nor was there any Noiſe heard upon the *Black Iſland*; but on the 31ſt of *July*, the Sea was ſeen to emit Smoak at two ſeveral *Places*, one of which was about 30, and the

other

other upwards of 60 Paces from the Iſland. In theſe two Places, both of which were perfectly round, the Water of the Sea look'd like Oil, and ſeem'd to riſe and bubble, which it continued to do for more than a Month; in which Time there were a great many Fiſh found dead on the Shore, by their happening to have been too near theſe two Places. The following Night there was heard a dull hollow Noiſe, much like that of ſeveral Cannons fired at a Diſtance; and at the ſame Time there was ſeen to riſe out of the Middle of the Funnel, Flames of Fire, which darted very high into the Air, and diſappear'd immediately. Next Day there were ſeveral Repetitions of the ſame Noiſe, follow'd by a Smoak, not white as uſual; and which, notwithſtanding a freſh North Wind, roſe up, in a Moment, to a prodigious Height, in Form of a Column; and would, in the Night-time, in all Probability, have appear'd, as if it were all on Fire.

Auguſt 7th, the Noiſe alter'd, and from being dull, as before, became very lõud, and reſembled that made by ſeveral large Stones thrown all together into a very deep Well; and *Goree* ſuppoſes, that this Noiſe was occaſion'd by ſeveral huge Pieces of Rock, which, after having been raiſed up with the Iſland by the Violence of the Fire, broke off by their Weight, and fell back again into the ſubterraneous Caverns. What confirmed him in this

this Opinion, was, that he ſaw, at that Time the Ends of this Iſland in ſo great Commotion, that after appearing for ſome Days, they then diſappear'd, and, after that, re-appear'd again. However it was, this Noiſe, after having continued for near a Month, was ſucceeded by another, much louder, and more extraordinary; it ſo nearly reſembled Thunder, that when it really thunder'd, as it did three or four Times, there was very little Difference between the one and the other.

As the Paſſage which the Fire had made itſelf, by its Violence, thro' ſo many Rocks, was not, probably, in a ſtreight Line, and in ſome Places narrower, and in others larger, and more free; ſo it is probable, that the Fire, or, rather, the ſulphureous and burning Exhalations, cauſed this great Noiſe, by turning from one Side to the other in theſe winding Caverns, and endeavouring to get a Paſſage out, which was difficult for them to find. And this is the Reaſon why the Noiſe of this ſubterraneous Thunder was ſometimes not ſo loud, and why, a little after, it grew more violent, and ſometimes ſo ſtunning, that People could not hear each other ſpeak; and why the *Black Iſland*, which was already very high, ſeemed to crack on every Side; and, in ſhort, why the impriſoned Fire, after ſeveral Windings and Turnings, having collected all its Force, was enabled to break out with a Noiſe,

Noiſe, equal to that of ſeveral Cannons diſcharged at once.

Auguſt 21ſt, the Smoak diminiſh'd conſiderably, as alſo the Fire, none appearing in the Night-time; but next Day both returned with greater Violence than any Time before. The Smoak was reddiſh, and very thick, and the Fire ſo great, that the Water of the Sea ſmoaked, and bubbled up around the *Black Iſland*. In the Night F. *Goree* view'd, with a Teleſcope, the great Fire that appear'd upon the Mountain of this Iſland, and he reckon'd 60 Openings, or Funnels, divided from each other by Rocks, all which emitted a very bright Flame. Probably there were others, and perhaps as many on the other Side of the Mountain, which he could not ſee. Next Morning he obſerv'd, that the Iſland had been very much raiſed in the Night-time; that a Range of Rocks, above 50 Foot long, had roſe out of the Water, which made the Iſland broader than it was before; and that the Sea was almoſt cover'd over with the reddiſh frothy Maſs above-mention'd. This Matter, or Froth, appear'd on the Sea every Time that the Iſland increas'd, and occaſion'd a Stench, much like that of the Sink of a Ship; which may be ſuppos'd to ariſe from a ſlimy Earth, mixed with Sulphur, which being raiſed up with the Rocks, and coming to be waſhed off by the Waves, was looſened, and diluted by

the Water, and ſo ſent up to the Surface, the Salts with which it was impregnated.

Hitherto the Fire had only appear'd in one Place, on the Top of the *Black Iſland*; but on the 5th of *September* it made itſelf another Paſſage, and appear'd at the Extremity of that Iſland, on the Side next *Teraſia*, another Iſland, that ſome Authors affirm to have been formerly joined to that of *Sant-Erini*, and ſeparated therefrom by an Earthquake. The Fire did not continue at this End but a few Days, which decreaſed at the Place from whence it commonly uſed to iſſue out; and here we were agreeably ſurprized to ſee the Fire dart out three ſeveral Times from this Place without any Noiſe, and riſe up in the Air like a large Rocket; the following Days there was much the ſame Appearance; for the ſubterraneous Thunder, after having made a great Noiſe, broke out, from Time to Time, with a Clap as loud as that of a Cannon, and was accompanied with a very beautiful and large Flame, which, ſhooting up in an Inſtant, to a great Height, fell down on the Iſland again, illuminating it almoſt all over. The Figure it made in the Air, reſembled very much a certain artificial Firework, in *French* called the *Gerbe*; but yet with this Difference, that the former roſe much higher, and much larger, but not ſo diſtinct as that of the *Gerbe*. Immediately after, there appear'd, in the Air,

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a Blaze, in the Shape of a long fiery Sword, which continued ſome Time, without moving, over the Caſtle of *Scaro*, and afterwards diſappear'd. At that Time alſo, the *White* and *Black Iſlands*, having increaſed in Length, in Proportion as they roſe in Height, united together; and the End of the *Black Island*, towards the North-Eaſt, did not increaſe any more, either in Height or Length, whilſt that towards the Weſt increas'd very ſenſibly to the Sight; which made F. *Goree* imagine, that the Mine of Sulphur being at this Place, and the Fire not finding any Paſſage out here, had Force to raiſe up this Part, and not the other; for in the Middle of the Iſland it always found Openings to iſſue out at, together with the Smoak; where it then had four Paſſages, ſo near each other, that one could not well diſtinguiſh them but by the Smoak, not that which commonly iſſued out, and was continual, but that which roſe up at ſome certain Times with great Force: For this Smoak came out ſometimes at one Paſſage, and ſometimes at another, and oftentimes out of the whole four together; ſometimes with a great Noiſe, and ſometimes with no Noiſe at all, tho' then it alſo iſſued out with the ſame impetuous Fire. There likewiſe came out of theſe Paſſages a whirling Noiſe, like that of an Organ Pipe with a Variety of Sounds. One would think, that the Noiſe of this Thunder ſhould not then be ſo loud, by reaſon of the ſeveral Paſ-

ſages above-mentioned; yet notwithſtanding it was not at any Time ſo great, and ſo frequent, as it was then, and as it was upwards of ſix Months after, when it was like the Report of a Cannon; and not a Day or Night paſſed, but 5 or 6, ſometimes 10 or 12 of them were heard, and at the ſame Time ſeveral large burning Stones were thrown into the Air; ſome of which falling on the *Great Kammeni*, ſet Fire to ſome Thickets, and others were caſt upwards of a Mile into the Sea. Theſe Claps were always attended with the Smoak already mention'd, very different from that which continually iſſued out from the Gulph of Fire almoſt in the Middle of the Iſland; for this latter was much thicker and blacker, and roſe, in an Inſtant, much higher, and was not diſperſed till ſome Time after, and then fell in Aſhes upon the Country, or into the Sea; ſome of which the Wind ſometimes carried as far as *Anacuphi*, an Iſland about 25 Miles diſtant from the Bay of *Sant-Erini*. Some of theſe Aſhes, which were of a Colour between Black and White, were put into the Fire, imagining they would have burnt like Gun-powder, which they very much reſembled, but they produced no other Effect, than making a ſmall hiſſing Noiſe.

September 18th, two Hours after Midnight, there was felt an Earthquake at *Sant-Erini*, though the ſubterraneous Fire had had a free Paſſage for ſo long a Time; it did not do

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any Damage, and had no other Effect than enlarging the Island very much, and removing, for some Days, the Fire and Smoak into other Places, thro' new Vents it made itself, increasing both of them very considerably. And, indeed, F. *Goree* never saw so much Fire, nor heard such terrible Claps, as after this Earthquake; by the Violence of these Claps, Houses were shaken at upwards of three Miles Distance; and out of the Middle of a great Smoak, which rose up, and appear'd like a Mountain, one might see and hear huge Pieces of Rock fall down into the Sea, and upon the Island, thrown out with the same Violence and Noise, as a Bullet out of the Mouth of a Cannon. The *Lesser Kammeni* was, several Times, cover'd over with large Stones, crusted over with burning Sulphur; several of which rolling afterwards from the Top of this little Island into the Sea, made a very bright Light, and afforded a pleasant Prospect in the Night. At first F. *Goree* thought, that the Fire had passed under Ground from the new Island to this, because they are not far asunder; but he soon found his Error, and that the Fire proceeded only from these Stones sulphur'd over; for the Sulphur with which they were crusted over, being consumed, they were all extinguished in Half a Quarter of an Hour, except some few that continued shining upwards of Half an Hour. One Day, when the Lesser

Kammeni

Kammeni was all on Fire, after one of theſe furious Claps, and the Air was ſo likewiſe, thro' the frequent Flaſhes of Fire that appeared in the Clouds; three Flaſhes were ſeen to come out of the Places where the Fire was, which one could not diſtinguiſh from real Lightning, but that they were formed lower, and at the two Ends of the Iſland; by the Violence of one of theſe Claps, Part of the Top of the new Iſland was carried off into the Sea, and ſeveral Stones thrown upwards of two Miles; and, as if the Mine had been exhauſted by this great Clap, three or four Days paſſed without any Noiſe, and almoſt without any Fire or Smoak. But the Fire ſoon kindled again, and the Iſland became more terrible than before. F. *Goree* was then at a Village ſix Miles off, where (notwithſtanding it lay under a Mountain) the Exploſion of the Mine was diſtinctly heard; the Caſtle of *Scaro* ſuffer'd ſo violent a Shock, that the Doors and Windows that were ſhut, were open'd by the Force of the Clap.

February 10th, 1708, at Half an Hour after Eight in the Morning, there was another Earthquake at *Saut-Erini*, and ſome Perſons aſſured, that there had been another the Night before, but not ſo ſenſible as this; and the Volcano was ſo far from being exhauſted, that it acquired new Force by other Veins of Sulphur, which took Fire at a greater Diſtance, as appeared from the Fire and Flames, which

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aroſe ſo frequently into the Air, and fell again over the Iſland, affording in the Night-time as fine a Sight as any artificial Fire-works. Beſides this, ſeveral large Rocks joining to the Iſland, which before were even with the Water, were now raiſed much higher; and the Noiſe, Smoak, and Boiling of the Sea increaſed much; the ſubterraneous Noiſe was more violent than ever, and continued ſeveral Days together without any Intermiſſion; and in a Quarter of an Hour the Mine diſcharg'd itſelf five or ſix Times; the Noiſe of which, with the large Quantity of Stones it threw into the Air, the Shocks it gave the Houſes, and the Fire which appear'd in open Day-light, (which was never ſeen before) very much ſurpaſſed all that had hitherto happen'd.

The 25th of *April*, was the moſt remarkable, both for the great Number, and Violence of the Claps; by one of which near 100 large Stones were thrown up, all at once, into the Air, which fell again, at about two Miles Diſtance, into the Sea. Tho' F. *Goree* was then about three Miles off from the new Iſland, he obſerved a Stone of a ſurprizing Bigneſs, which did not riſe ſo high as the reſt, but was driven farther, in a ſtreight Line, like a Cannon Ball.

From the 15th of *April* to the 23d of *May*, (which was a Year from the Production of *this Iſland*) nothing in particular was obſerv-

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ed, only that the Iſland increaſed in Height, and not in Length; and that one furious Clap beat down, at once, all its Top, which, by the Aſhes, and Stones of all Sizes, that fell upon it both Day and Night, became much higher than it was before. After this, every Thing began to abate, the Smoak decreaſed, the ſubterraneous Noiſe was not ſo violent, and the Claps, tho' very frequent, were not, however, ſo loud, becauſe the Funnels, which gave Vent to the Fire and Smoak, were then much larger than they were before.

Hitherto F. *Goree* had view'd this Island only at a Diſtance; but, ſeeing then that there was no Danger, he went with F. *Criſpo*, the *Latin* Biſhop of *Sant-Erini*; and going directly to it, they were oblig'd to paſs over a Place, where the Sea ſmoak'd very much, but did not bubble; where they were no ſooner come, than they perceiv'd a Heat ſtrike upon their Faces, which was no other than the Fumes of the Sulphur. Upon putting their Hands into the Water, they felt it very hot. They were then 500 Paces from the new Island; from whence they went directly over to that Part of the Island, where it had increas'd in Length; but ſeeing the Smoak was very thick, which ſhew'd there was a great Fire all thereabouts, they did not think it ſafe to go any nearer, and ſo ſatisfied themſelves with only viewing the Space that was between *this new Island* and the *Leſſer Kammeni*, thro'

the narroweſt Part of which they judged a Galley might paſs. After this, they went aſhore on the *Great Kammeni*, from thence to view the whole burning Iſland nearer, and without Danger, eſpecially that Side of it which was ſcarcely ſeen from the Caſtle of *Scaro*. From hence it was, that after having examin'd every Particular, they judged this new Iſland to be about 200 Yards in Height, five Miles in Circumference, and a Mile over at its broadeſt Part; as to its Form, it is oblong, and reſembles, in ſome Meaſure, the Figure of a Dragon. After having tarried ſome Time upon the *Great Kammeni*, (where they often ſaw, at no great Diſtance, a great many Stones thrown violently out of the Gulph of Fire, and fall down again, with a terrible Noiſe upon the Iſland) they reſolv'd to coaſt it round, and go to the other End of it, where the Iſland had not increas'd for ſeveral Months, and where there did not appear any Fire or Smoak. They were within 100 Paces of it, when putting their Hands into the Water, they perceiv'd it warm, and that the farther they went, the hotter it grew. At this Inſtant the Mine diſcharg'd itſelf, and the Wind drove upon them the thick Smoak, which broke out with great Violence every Time the Mine took Fire, and a Shower of Aſhes and ſmall Stones, no bigger than little Hail-ſtones, falling upon them, they were oblig'd to quit their Deſign; and letting down

a Plummet, they had, at this Place, 95 Fathoms of Water, without finding the Bottom, the Line not being long enough. Afterwards viewing the Space at this End, between the Iſland and the *Leſſer Kammeni*, they found, in ſeveral Places, that it was narrower at this Side, than at the other; and that if the new Iſland ſhould continue to grow bigger, ſeveral Rocks, which were already half above the Water, and roſe up nearer to the *Leſſer Kammeni*, would, in Time, ſhut up the Paſſage, and join both Iſlands together, ſo as to make a little Port between them, which would be very commodious for the Shipping of *Sant-Erini*. Afterwards returning to the Caſtle of *Scaro*, they paſſed by the little Port of the *Leſſer Kammeni*, and notwithſtanding its Nearneſs, the Inhabitants could not hear any of the Noiſe that this new Iſland made, which was owing to its Height.

During the reſt of the Time that F. *Goree* tarried at *Sant-Erini*, to the 15th of *Auguſt* 1708, (at which Time he came away) the Smoak, Fire, Noiſe, *&c.* continued much the ſame as has been now deſcrib'd, that is, always pretty moderate. From his leaving *Sant-Erini* to the 6th of *July* 1711. F. *Goree* receiv'd ſeveral Letters, and ſaw and ſpoke with ſeveral Perſons that came from thence; and they all told him, that the new Iſland ſtill grew in Length, on that Side next *Teraſia*; *that then* it was about ſix Miles in Circumfe-

rence; that as to the Fire, and Noiſe under Ground, they were more moderate than before. F. *Goree* conſidering, that the Paſſages which give Vent to the Fire are very large, and almoſt in the Middle of the Iſland; and that there is no Appearance, that the Fire will ever make a Paſſage at the Bottom of the Sea, ſo as to let the Water in, to extinguiſh it, ſuppoſes, that this Phenomenon will not have an End, till the Mine of Sulphur be entirely conſum'd.

An Account of a ſurprizing FALL *of* WATER, *from a* Spout *on the* Moors *of* Lancaſhire, *by Dr.* RICHARDSON.

DR. *Richardſon* gives the following Account of a remarkable *Spout of Water*, that fell on *Emott-Moor*, near the *Coln* in *Lancaſhire*, on the 3d of *June* 1711, about 10 o'Clock in the Morning; when ſeveral Perſons, who were employ'd near the Place where this Accident happen'd, on a ſudden were ſo terrified with an unuſual Noiſe in the Air, that they left their Work, and ran Home, which was about a Mile from the Place; but, to their great Surprize, they were intercepted by Water; for a ſmall Brook in the Way was riſen,

riſen, upwards of ſix Feet perpendicular, in a few Minutes of Time, and had overflow'd the Bridge.

It was obſerv'd, that there was no Rain, at that Time, on *Emott-Moor*, only a Miſt, which is very frequent upon thoſe Mountains in Summer-time. There was a great Darkneſs in the Place where the Water fell, without either Thunder or Lightning, as the Doctor was inform'd by an Eye-witneſs. The Meadows at *Wicolae* were overflown ſo much, that the like had not been obſerv'd in ſeveral Years before, though there it was a very bright Day.

The Doctor went to view the Place, and found that the Ground was torn up to the very Rock where the Water fell, which was upwards of ſeven Foot deep, and a deep Gulph which was form'd for about Half a Mile, and vaſt Heaps of Earth caſt up on each Side of it; ſome Piles ſtill remaining upwards of 20 Foot over, and ſix or ſeven Foot thick. About ten Acres of Ground were deſtroy'd by this Flood. The firſt Breach where the Water fell, was about 60 Foot over, and no Appearance of any Eruption, the Ground being firm about it, and no Cavity appearing. It is to be obſerv'd, that the Ground on each Side the Gulph was ſhaken in ſuch a Manner, that large Chaſms appear'd at upwards of 30 Foot Diſtance.

Obſervations

Obſervations on the ERUPTIONS *of Mount* VESUVIUS; *by Mr.* BERKELEY.

APRIL 17th, 1717, Mr. *Berkeley*, with much Difficulty, reach'd the Top of Mount *Veſuvius*, in which he obſerv'd a vaſt Aperture, full of Smoak, which hinder'd his ſeeing its Depth and Figure. He heard, within that horrid Gulph, certain odd Sounds, which ſeem'd to proceed from the Belly of the Mountain, as alſo a murmuring, fighting, throbbing, churning, and daſhing of Waves, as it were, and, at Times, a Noiſe like that of Thunder or Cannon, which was conſtantly attended with a Clattering like that of Tiles, falling from the Tops of Houſes on the Streets; ſometimes, as the Wind changed, the Smoak became thinner, diſcovering a very ruddy Flame, and the Jaws of the Pan, or *Crater*, were ſtreak'd with Red, and ſeveral Shades of Yellow. After an Hour's Stay, the Smoak, being mov'd by the Wind, afforded ſhort and partial Proſpects of the great Hollow; in the flat Bottom of which, Mr. *Berkeley* could diſcern two Furnaces almoſt contiguous; that on the Left ſeeming to be *about three* Yards in Diameter, glow'd with red

red Flame, and threw up red-hot Stones with a hideous Noiſe; which, as they fell back, caus'd that hideous Clattering.

May 8th, in the Morning, Mr. *Berkeley* went up, a ſecond Time, to the Top of *Veſuvius*, and found a different Face of Things; the Smoak aſcending upright, gave a full Proſpect of the *Crater*, which, as he could judge, was about a Mile in Circumference, and 100 Yards deep; a conical Mount had been formed ſince his laſt Viſit, in the Middle of the Bottom. This Mount, he could ſee, was formed of the Stones that were thrown up, and fallen back again into the *Crater*; in this Hill there remain'd the two Mouths, or Furnaces already mention'd, that on the left Hand was on the Top of the Hill, which it had formed round it, and raged more violently than before, throwing up, every three or four Minutes, with a dreadful Bellowing, a vaſt many red-hot Stones, ſometimes, in Appearance, upwards of a thouſand, and at leaſt 300 Feet higher than his Head, as he ſtood upon the Brink; but there being little or no Wind, they fell back perpendicularly into the *Crater*, increaſing the conical Hill. The other Mouth, to the Right, was lower in the Side of the ſame new-formed Hill; Mr. *Berkeley* could diſcern it to be fill'd with red-hot liquid Matter, like that in the Furnace of a Glaſs-houſe, which raged and wrought like the Waves of the Sea, *cauſing* a ſhort abrupt Noiſe, like what might be

be imagin'd to proceed from a Sea of Quick-ſilver, daſhing among uneven Rocks. This Subſtance would overflow, and run down the convex Side of the conical Hill, and appearing, at firſt, red-hot, it chang'd Colour, and harden'd as it cool'd, ſhewing the firſt Rudiments of an Eruption, or an Eruption in Miniature, as it were. Had the Wind blew directly in the Spectators Faces, they had been in no ſmall Danger of being ſtifled by the ſulphureous Smoak, or being knock'd on the Head by Lumps of broken Minerals, which were ſeen ſometimes to fall on the Brink of the *Crater*, upon thoſe ſhot from the Gulph at Bottom; but as the Wind was favourable, Mr. *Berkeley* had an Opportunity of ſurveying this odd Scene for above an Hour and a Half together, during which Time it was very obſervable, that all the Vollies of Flame, Smoak, and burning Stones, came out of the Hole to the Left, while the liquid Matter, in the other Mouth, wrought and overflow'd, as has been already deſcrib'd.

June 5th, after a horrid Noiſe, the Mountain was ſeen, at *Naples*, to ſpew a little out of the *Crater*; the ſame continu'd the 6th; the 7th nothing was obſerv'd till within two Hours of Night, when it began a hideous Bellowing, which continu'd all that Night, and the next Day till Noon, cauſing the Windows, and, as ſome affirm, the very Houſes in *Naples* to ſhake. From that Time it belch'd out

vaſt

vaſt Quantities of molten Matter, to the South; which ſtreamed down the Side of the Mountain, like a Pot boiling over. This Evening, Mr. *Berkeley*, returning from a Journey thro' *Apulia*, was ſurpriz'd, upon paſſing by the North Side of the Mountain, to ſee a large Quantity of ruddy Smoak lie along a large Tract of Sky over the River of molten Matter, which was itſelf out of Sight. The 9th, *Veſuvius* rag'd leſs violently, and that Night a Column of Fire was ſeen, from *Naples*, to ſhoot, at Times, out of its Summit. The 10th, when it was thought all would have been over, the Mountain grew very outrageous again, roaring and groaning moſt dreadfully. This Noiſe, in its moſt violent Fits, was like a mix'd, confuſed Sound, made up of the raging of a Tempeſt, the Murmuring of a troubled Sea, and the Roaring of Thunder and Artillery. It was very terrible, as heard in the farther End of *Naples*, at the Diſtance of above 12 Miles. This mov'd Mr. *Berkeley*'s Curioſity to approach the Mountain; and, for this End, he, and three or four others, got into a Boat, and were ſet a-ſhore on *Torredel Groco*, a Town ſituated at the Foot of *Veſuvius*, to the South-weſt, whence they rode four or five Miles, before they came to the burning River, where they arriv'd about Midnight. The Roaring of the *Volcano* grew exceeding loud and horrible as they approach'd. Mr. *Berkeley* obſerv'd a Mixture

of

of Green, Yellow, Red and Blue, in the Cloud over the *Crater*; there was likewiſe a ruddy diſmal Light over that Tract of Land, where the burning River flow'd; Aſhes continually ſhower'd upon them all the Way from the Sea-coaſt; all which Circumſtances, together with the Horror and Silence of the Night, made a Scene the moſt uncommon and aſtoniſhing Mr. *Berkeley* had ever ſeen, and which ſtill grew more extraordinary, the nearer they came to the Stream, reſembling a vaſt Torrent of liquid Fire, rolling from the Top down the Side of the Mountain, and, with irreſiſtible Fury, bearing down and conſuming every Thing that ſtood in its Way. This mighty Flood divided into two different Channels, according to the Inequalities of the Mountain; the largeſt Stream ſeem'd Half a Mile broad, at leaſt, and five Miles long. Mr. *Berkeley* walk'd ſo far before his Companions, up the Mountain, along the Side of the River of Fire, that he was oblig'd to retire in great Haſte, the ſulphureous Steam having ſurpriz-ed him, and almoſt taken away his Breath.

During their Return, which was about three o'Clock in the Morning, they conſtantly heard the Murmuring and Groaning of the Mountain, which, at Times, would burſt out into louder Peals, throwing up large Spouts of Fire, and burning Stones, which falling down again, reſembled the Stars in Rockets. Sometimes he obſerv'd two, at other Times three diſtinct

diſtinct Columns of Flame, and ſometimes one vaſt Column, that ſeem'd to fill the whole *Crater*; theſe burning Columns, and the fiery Flames ſeem'd to be ſhot a thouſand Feet perpendicular Height above the Summit of the *Volcano*.

The 11th at Night, he obſerv'd it, from a Terraſs in *Naples*, to throw up, inceſſantly, a vaſt Body of Fire and Stones to a ſurprizing Height. The 12th in the Morning it darkened the Sun with Aſhes and Smoak, cauſing a Sort of an Eclipſe. This, and the preceding Day, horrid Bellowings were heard at *Naples*, whither Part of the Aſhes had alſo reach'd. At Night he obſerv'd it to throw up Flame, as on the 11th. On the 13th the Wind changing, they ſaw a Pillar of black Smoak ſhot up to a prodigious Height; at Night he obſerv'd the Mount caſt up Fire, as before, tho' not ſo diſtinctly, becauſe of the Smoak. The 14th, a thick black Cloud hid the Mountain, ſo as not to be ſeen at *Naples*. The 15th in the Morning, the Court and Walls of the Houſe in which Mr. *Berkeley* lodg'd at *Naples*, were cover'd with Aſhes; in the Evening a Flame appear'd on a Mountain through the Cloud. The 16th the Smoak was driven by a weſterly Wind, from the Town to the oppoſite Side of the Mountain. The 17th the Smoak appear'd much diminiſh'd, fat and greaſy. The 18th the whole Appearance ended, the Mountain remaining perfectly quiet, without a viſi-

ble Smoak or Flame. A Gentleman, whoſe Window look'd towards *Veſuvius*, aſſur'd Mr. *Berkeley*, that this Night he obſerv'd ſeveral Flaſhes of Lightning, as it were, iſſue out of the *Volcano*.

An Account of a new-rais'd Iſland, *out of the Sea, near* Tercera; *by Mr.* FORSTER.

JOHN ROBINSON, Maſter of a ſmall Pink-Snow, from *Piſqua-taqua* in *New-England*, arriv'd at *Tercera*, *Decemb.* 10, 1720; at 17 Leagues Diſtance, bearing S. E. from the ſaid Iſland, he obſerv'd a Fire break out of the Sea. *Decemb.* 18, he got under Sail, at 12 o'Clock at Night, and ſtood from *Angras* S. E. The next Day, at two o'Clock in the Afternoon, he made an Iſland all Fire and Smoak; he continu'd his Courſe, till the Aſhes fell all Night on Deck, like Hail or Snow. He bore from it, and the Fire and Smoak roar'd like Thunder, or great Guns; at Break of Day he ſtood towards it again; at 12 o' Clock he had a good Obſervation, two Leagues South from it; he ſail'd round it, and ſo near, that the Fire and Matter it threw out, had like to have done him Damage; in which Conſternation all betook themſelves to

Prayers, being in Danger of driving a-ſhore; then a ſmall Gale ſprung up at S. E. and carried them clear, to their great Joy; the Breeze was accompanied with a ſmall Shower of Rain, which caus'd a great Duſt to fall on Deck; with the ſaid Breeze he ſtood away for *Tercera*. The Governor inform'd him, that the Fire broke out *Nov.* 20, 1720, in the Night, and that the prodigious Noiſe it made, caus'd an Earthquake, which ſhatter'd ſeveral Houſes in the Town of *Angras*, and Places adjacent. Prodigious Quantities of Pumice-Stones, and half-broil'd Fiſh, were found floating in the Sea ſeveral Leagues round the Iſland, and Abundance of Sea-fowl hovering about it.

Mr. *Forſter* was inform'd, by an Acquaintance, that, in his Paſſage from *Cadiz* to *London*, the latter End of *April* 1721, he obſerv'd the Sea, from *Cape Finiſterre*, almoſt to the Chops of the Channel, cover'd with Pumice-Stones, ſome of which he gave him.

An Account of an EARTHQUAKE, *at* Boſton *in* New-England; *by Mr.* BENJAMIN COLMAN.

THE Earthquake came ſuddenly on, in the Night, *October* 9th, 1727, between *10 and 11* o' Clock, in a very ſtill and fair Evening;

vening; the Stars ſo bright and glittering, that ſeveral People had taken particular Notice of them; and one or two Perſons that had been in Places ſubject to Earthquakes, had ſaid, tranſiently, that if we had been uſed to them, they ſhould expect one. This was the only general Symptom of its Approach Mr. *Colman* heard of, namely, the moſt ſerene Sky and calm Air that ever was known, not a Cloud in the Sky, nor ſcarce a Breath of Wind ſtirring. And tho' this be not univerſally a Symptom of Earthquakes coming on Places; yet, ſo far as he could inform himſelf, it has frequently, and for the moſt Part, been obſerv'd. It was ſo in the dreadful Shock in *Jamaica*, upwards of 90 Years before: And a very ingenious Friend of Mr. *Colman*'s inform'd him, that after that Shock, that was follow'd with ſeveral Tremors, and leſſer Concuſſions, he could, from Day to Day, judge of the Face of the Sky and Air, whether there would be any Tremor of the Earth. If there were any Cloud hanging over any mountainous Part of the Iſland, there was no Shake that Day; but if all was ſerene and fair, he expected one, and it ſeldom fail'd of happening.

Yet it was not found ſo in the After-Tremors, which frequently returned for ſome Months after this great Shock; and at Times for nine Months.

The

The Town of *Newbury*, at the Mouth of *Merrimack River*, about 40 Miles North-eaſt from *Boſton*, is the Place that ſeems to have been the Centre of the Shock and Tremors felt. There the Earth open'd, and threw up ſeveral Loads of fine Sand and Aſhes, mix'd with ſome ſmall Remains of Sulphur; ſo that taking up ſome of it between the Fingers, and dropping it on a Chafing-diſh of bright Coals, in a dark Place, once in three Times the blue Flame of the Sulphur would plainly ariſe, and yield a very ſmall Scent. By this it ſeems evident, that it was a ſulphureous Blaſt which burſt open the Ground, and threw up the calcin'd bituminous Earth. The Family neareſt to this Eruption (it being in that Part of the Town where the Houſes lie at a Diſtance from each other) were in the utmoſt Conſternation; the Shock and Noiſe being much more terrible upon them than upon the others: And yet, at 40 Miles Diſtance, and upwards, it was very dreadful and aſtoniſhing.

After the firſt and great Shock, five or ſeven ſmall Tremors were felt, that Night and next Morning; but theſe, and other following Rumblings and Tremors, were louder and greater at *Newbury*, and the adjacent Places: But yet, at 40 Miles Diſtance were felt and heard ſome of the greater ones, both by Day and Night.

Mr.

Mr. *Colman* had the following Account from Mr. *Lowel*, Miniſter in *Newbury*.

As to any previous Notices of the Approach of the Earthquake, I cannot find any Thing to be depended on. The Prognoſtications that have been among us have all failed; ſuch as, an unuſual Brightneſs of the Sky, Twinkling of the Stars, *&c.* I certainly know, that we have heard the Rumblings in all Weathers, cloudy, foggy, rainy, ſnowy, clear, cold, hot, moderate, windy, calm, *&c.* indifferently; and at all Hours of the Day and Night (tho' we oftener heard theſe Rumblings in the Night during Winter, as I think, and ſince, more commonly in the Day) as alſo when the Wind has been at any Point of the Compaſs, and at all Times of Tide; and as to the Moon, equally when ſhe was near, or farther from her Change, or Full; neither in any particular Weather, nor on any obſervable Occaſion, were the Shocks greater, or Rumblings louder.

As to any Alterations in the Air, or Water, after a Shock, I could never diſcern any; particularly, as to the Wind being rais'd after a Shock, when it was calm before, which ſome reported, but I could never perceive the leaſt Difference.

One Thing I may add here, which is very remarkable, and may be depended on: That about the Middle of *April*, that fine Sand, which was thrown up in ſeveral Places in this Parish,

Pariſh, at the firſt great Shock, *October* 29th, had a very offenſive Stench, nay, was more nauſeous than a putrifying Corps; yet, in a little while after, it had no Smell at all. How long it was before it began to have this Stench, I am not certain; I know it had it not at firſt; and I believe it was cover'd with Snow till a little while before. There is no Smell now; there has been no Opening of the Ground, throwing up of Sand, ſtopping or breaking out of Springs, *&c.* as at firſt. *Newbury* (as alſo the adjacent Towns) is a Spot of Ground very much inhabited, and continually travell'd over; and as to the Sea, contiguous to theſe Parts, it is full of our Coaſters Day and Night; but no ſenſible Eruptions or Evacuations (that I hear of) have been obſerv'd either on Land or Water.

An Account of an EARTHQUAKE, *that, in* 1731, *infeſted* Apulia, *and almoſt all the Kingdom of* Naples; *by Dr.* CYRILLUS.

DR. *Cyrillus* made the following ſhort Abſtract, from the Obſervations ſent him by Dr. *Roſetti*, from *Apulia*, and from thoſe of others, who liv'd at *Giovenazzo* and *Foggia*.

March

March 9, 1730-1, O. S. at 4 in the Afternoon, there was an Earthquake almoſt all over the Kingdom of *Naples*, but it was felt moſt in *Apulia*. While it laſted, all thoſe Appearances taken Notice of by the Antients, were here alſo obſerv'd. As, firſt, a Tremor; then a Pulſe, according to *Ariſtotle*, or a Succuſſation, as *Poſſidonius*, from *Seneca*, calls it; and laſt of all, an Inclination, or a Nutation of the Earth, like that of a Ship, as it were. Theſe various Nutations ſucceeded one another alternately for three Minutes, and a few Seconds. It was not obſerv'd by Dr. *Roſetti*, whether Nutations and Oſcillations were made in parallel Circles of the Earth, as modern Philoſophers have conſtantly obſerv'd of this Phænomenon; which is a conſiderable Argument for the diurnal Rotation of the Earth. At that Time the Air was overcharg'd with denſe, low, and immoveable Clouds, which were afterwards diſſipated by a gentle, northerly Wind. Next Day the Sun ſhone more languid, as if he had been cover'd with very thin Clouds, tho' there were then none in the Heavens. This Phænomenon was alſo obſerv'd in the following ſtronger Shock. The Fiſhermen near the Shore obſerv'd the Sea ſwell ſuddenly, and they weather'd out a Storm from *Lipante* and *Barbetta*, that is nearly, from the North, without any Wind, but not without Apprehenſions of being Ship-wreck'd.

March 10, at 8 o'Clock in the Forenoon, there happen'd a new, but a ſhorter, and withal, a weaker Earthquake in the ſame Province; but not ſo weak but that it was felt at *Naples*. This was preceded by a Kind of Accenſion, or ſhort Coruſcation about Mount *Garganus*, obſerv'd by the Inhabitants of *Terra di Bari*, which inſenſibly vaniſh'd into Smoak or Darkneſs. In the Parts about *Foggia* a ſtrong N. E. Wind generally preceded this ſecond Earthquake, as alſo the others that happen'd afterwards, in *April*, *October*, and *November*; tho' ſometimes the Air was altogether calm. The Number of Houſes that fell, and of Men buried in their Ruins was conſiderable; and from thence they diffus'd themſelves into more remote Places, the *Impetus*, or Violence, gradually remiting; ſo that it may be ſaid, that the Propagation of that Earthquake was exceſſively diminiſh'd (unleſs the different Solidity and Interruption of the interjacent Earth caus'd any Alteration) in the duplicate Ratio of the Diſtances, according to the common Laws of Nature in other Kinds of Motion; which was carefully obſerv'd in the Oſcillation of Pendulums placed at different Diſtances from *Foggia*. For Pendulums of a Palm in Length at *Aſcoli di Satriano*, and at *Giovenazzo*, and applied to a graduated Semi-circle, and moving in the Concuſſions of the Earth, erred more or fewer Degrees from the Center of Oſcillation, according as they were more or leſs diſtant

from

from *Foggia*. For, the Number of theſe Degrees, (greater in the nigher *Aſcoli*, and leſs in the remoter *Giovenazzo*) anſwer'd nearly to the duplicate Ratio of the Diſtance of theſe Places from the Center of the Earthquake. And hence it likewiſe happen'd, that when there was but a very ſlight Trembling at *Foggia*, the Pendulum mov'd ſlowly at *Aſcoli*, but ſtood ſtill at *Giovenazzo*.

In almoſt all the Shocks for the Year, it was conſtantly obſerv'd, that a Craſhing in the Air, and a horrid Noiſe preceded them; *Pliny*, Lib. 2. P. 80. alſo obſerves, that ſometimes terrible Sounds, Bellowings, and Shouts like human, uſher'd in Earthquakes. This Craſhing of the Air was diffus'd in a contrary Direction: For, whereas the Parts of the Earth were ſhook by a Motion from the Center to the Circumference; ſo, on the contrary, the Motion of the Air plainly converged from the Circumference to the Center; which Phænomenon may have yielded no ſmall Matter of Speculation to Naturaliſts. The Doctor would obſerve, that this is different from what *Ariſtotle* thought was the Caſe with Meteors; namely, that an external Wind muſt contribute to an Earthquake, as, according to him, the Coaſt of *Arabia* was ſhook by the Conflict of a North and South Wind; unleſs, perhaps, you would ſay, as ſome have ſuſpected, that, at leaſt, the ſlight and oſcillating Earthquakes, produced after ſtrong eaſterly Winds, might have

have been owing to the retarded diurnal Motion of the Earth, at leaſt in that Tract where the Wind blew.

Laſtly, it is worth obſerving in this Earthquake, that near a Country Farm of *Carthuſians*, call'd *Tré Santi*, (whoſe Houſe had, by the Earthquake, been levell'd with the Ground ſince the firſt of *March*) in that Spot where the Channel of the *Fontane del Poſſe* is moſt depreſs'd, there broke out, in a plentiful Stream, a new Spring of muddy and hot Water. This, indeed, is no new Thing, nor was it unknown to the Antients; ſince we find, from their Accounts, that Waters burſt out when the Body of the Earth opens, in the ſame Manner as Water enters thro' the Seams of a Ship; they give an Account, not only of ſmall Streams, but Deluges of Water that drowned whole Cities; which may ſeem more probable with thoſe that hold with *Thales*, according to *Seneca*, that the Earth, ſupported by the Waters, ſometimes floats like a Ship: But theſe Things will ſeem abſurd to ſuch as know the true Structure of the terraqueous Globe. The Water that burſt out in *Apulia*, began to dry up gradually, and in a Month's Time it quite diſappear'd; but the dry Land, even for ſome Time, retain'd a ſulphureous Smell. Thus *Pliny*, *Lib.* 31. 14. affirms, that Earthquakes pour out, and drink up Waters: Wherefore, it is not ſurprizing, that we have *Accounts* of Lakes, Fountains, and Rivers

breaking

breaking out, where there were none before, and of others being dried up. It was univerſally reported, that ſhallow Wells did, at the Time of the firſt Earthquake, throw out their Waters from their wide Mouths: Yet it is not at all credible, that from the greateſt Shock Water ſhould burſt out, (for this could not have happen'd without, at leaſt, overturning and entirely deſtroying the Kingdom of *Naples*) but that probably new Water ſpringing up in the Bottom of theſe Wells, as in other Places, and filling their Cavities, it was thrown out.

In fine, the Water, which, as has been ſaid above, had burſt out near *Tré Santi*, which produced the following Phenomena.

1. Bulk for Bulk by the Areometer, it weigh'd 82 Grains more than Rain Water, and only 15 Grains more than the Water of a brackiſh Fountain in that Place.

2. A Pound of the ſame Water diſtill'd to Dryneſs, left behind, in the Bottom of the Veſſel, half a Drachm of a Subſtance inclining to the Nature of *Croçus Martis*, ſprinkled over with a Scruple of white and inſipid Earth: The Loadſtone attracted ſome reddiſh Particles from this Duſt after drying it. In the Diſtillation a ſulphureous Smell was very ſenſible. And hence, after the Experiments of the celebrated M. *Lemery*, we have a new Acceſſion of Arguments, that ſubterraneous Fires and Volcano's may be eaſily accended by the Com-

Commixture of Sulphur and Iron; and conſequently, that Earthquakes may be produced by the ſucceſſive Kindling of latent Fires.

3. In fine, 10 Drachms of the Galls, call'd *di Cevante*, and with which Ink is made, reduced to a very fine Powder, and infuſed in two Pounds of that Water, began to tinge it of a light azure Colour, with a ſubſequent Precipitation of the Powder.

Effects of LIGHTNING; *by Mr.* JOSEPH WASSE.

AT *Mixbury*, on *July* 3, 1725, about two in the Afternoon, one *William Hall*, about 60 Years of Age, was found dead in a hard gravelly Field, together with five Sheep, which lay round him at about 30 Yards Diſtance, which he is ſuppoſed to have been driving; of the five, only that, which lay neareſt him, had a viſible Wound through the Head. The Man lay partly upon his Side; the upper Part of his Scull was terribly fractur'd, and his right Knee out of Joint; he had a Wound in the Sole of his Foot, towards the Heel; his right Ear was cut off, and beaten into his Scull, and the Blood flowed out of that Part upon the Ground; all his Cloaths and Shirt were tore to ſmall *Pieces*, and hung about him; but from

the Girdle downwards they were entirely carried away, and ſcattered up and down the Field; particularly the Soles of a ſtrong new Pair of Shoes were rent off; his Hat was torn in Pieces; Mr. *Waſſe* had a Hand-breadth of it, full of irregular Slits, and ſome few Places cut, as it were, with a ſharp Pen-knife, and a little ſinged in the upper Part; his Beard and the Hair of his Head were for the moſt Part, cloſe burnt off; the Iron Buckle of his Belt was thrown forty Yards off; and a Knife in the Right-ſide Pocket of his Breeches was broken to Pieces, not melted, and the Haft ſplit; near each Foot appeared two round Holes, about a Yard deep, and five Inches Diameter, which ſhews the Force of the Blow. About the Time this Accident happened, a Tradeſman of *Mixbury* obſerved a Fire-ball, as large as a Man's Head, to burſt in four Pieces near the Church. The Storm began at about half an Hour paſt One of the Clock, and laſted, with Intermiſſion, till half an Hour paſt Two, and we obſerved the Lightning towards *Ayleſbury* all the Evening. Two Perſons at *Aynho* were a little burnt at the ſame Time, and one of them ſtruck down to the Ground; Mr. *Waſſe* himſelf heard the Hiſs of a Ball of Fire, almoſt as big as the Moon, that flew over his Garden S. E. to N. W.

To make a groſs Eſtimate of the Force, Mr. *Waſſe* took a Cohorn, charged with three Quar-

Quarters of a Pound of a very good Powder, wadded with thick Paper, and fired it againſt a Stone of the ſame Dimenſions, but not ſo hard, which it ſhattered to Pieces at half an Inch's Diſtance. But in the above-mentioned Blow, there was above treble the Effect, without any diſcoverable Particles at all; and yet it ſeems to fly like ſmall Shot, pierces only here and there, and leaves a great many Places quite untouched, as was evident from the Hat Mr. *Waſſe* had by him. To confirm this, one *Iſaac Marſhal* of *Mixbury* aſſured him, that in the Middle of the ſame Storm, he received a Blow upon his Hat, which rattled like Shot through the Branches of a Tree; it beat in the Crown of the Hat a little, without perceiving it; he ſtaggered, and was giddy for two Days afterwards. Two of his Sons were knocked down to the Ground at the ſame Inſtant, and ſtunn'd a little; but preſently came to themſelves, and had no Wound. *Query*, Whether this may not be accounted for, by ſuppoſing the Flame to rarify the Air, and make a Sort of *Vacuum* about one; into which when it returns again, it gives a Stroke, like that of a Beetle, as he expreſs'd it. Mr. *Waſſe* ſuppoſes that a Wind Gun, with compreſſed Air, would have the ſame Effect, and might eaſily be tried upon a Dog, or ſome ſuch Animal.

FINIS.

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